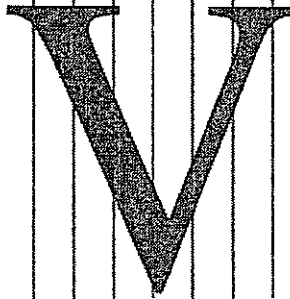


R E G I O N



Remedial Planning Activities At Selected Uncontrolled Disposal Sites

U.S. EPA Contract No. 68-W8-0089

Roy F. Weston, Inc.

Dames & Moore

Engineers International, Inc.

Life Systems, Inc.

Hubbell, Roth & Clark, Inc.

Reid, Quebe, Allison, Wilcox & Associates, Inc.

Mary Sexton Associates

**FOCUSED SITE INSPECTION
PRIORITIZATION REPORT
VULCAN MATERIALS COMPANY
GARY, INDIANA
LAKE COUNTY
IND005444732**

September 1995

**Prepared for
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604**

**This document was prepared in accordance with U.S. EPA Contract No. (68-W8-0089),
WESTON Region V Alternative Remedial Contracting Strategy (ARCS).**

Work Assignment No.: 48-5JZZ

Document Control No.: 4500-48-ALVI

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1	INTRODUCTION	1-1
2	SITE BACKGROUND	2-1
2.1	Site Location	2-1
2.2	Site Description	2-1
2.3	Operational History and Waste Characteristics	2-4
2.4	Prior Investigations	2-5
2.5	Site Reconnaissance Inspection	2-5
3	SOURCE SAMPLING	3-1
3.1	Soil Sample Locations	3-1
3.2	Soil Sampling Procedures	3-7
3.3	Analytical Results	3-8
3.4	Summary	3-13
4	GROUNDWATER PATHWAY	4-1
4.1	Geologic and Hydrogeologic Settings	4-1
4.2	Targets	4-2
4.3	Summary	4-2
5	SURFACE WATER PATHWAY	5-1
5.1	Hydrologic Setting	5-1
5.2	Targets	5-1
5.3	Sediment Sampling Locations	5-3
5.4	Sediment Sampling Procedures	5-3
5.5	Analytical Results	5-6
5.6	Summary	5-11
6	SOIL AND AIR EXPOSURE PATHWAYS	6-1
6.1	Physical Conditions	6-1
6.2	Targets	6-1
6.3	Soil Analytical Results	6-1
6.4	Air Analytical Results	6-1
6.5	Summary	6-3
7	SUMMARY	7-1
8	REFERENCES	8-1

CH01\PUBLIC\WO\ARCS\040\18311.TOC

i

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
2-1	Site Location Map	2-2
2-2	Site Features Map	2-3
3-1	Soil Sample Location Map	3-2
3-2	Background Soil and Sediment Sample Location Map	3-3
5-1	Sediment Sample Location Map	5-4

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
3-1	Subsurface Soil Sample Locations and Rationale	3-4
3-2	Subsurface Soil Sampling Results	3-9
3-3	Key Analytical Findings of Soil Sampling	3-14
5-1	Population for Surface Water Intakes	5-2
5-2	Sediment Sample Locations and Rationale	5-5
5-3	Sediment Sampling Results	5-7
5-4	Key Analytical Findings of Sediment Sampling	5-12
6-1	Population Within a 4-Mile Radius	6-2

LIST OF APPENDICES

Appendix

- A 4-Mile Radius Map
- B Photographs
- C TCL Compounds and TAL Analytes and Their Quantitation Limits
- D Well Logs
- E 15-Mile Downstream Map
- F Sensitive Environment

SECTION 1

INTRODUCTION

Roy F. Weston, Inc. (WESTON®) was tasked by the United States Environmental Protection Agency (U.S. EPA) to conduct Focused Site Inspection Prioritization (FSIP) of the Vulcan Materials Company site under Contract Number 68-W8-0089 and Work Assignment number 048-5JZZ.

The purpose of listing assessment sites in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) data base is to determine whether these sites are candidates for inclusion on the National Priorities List (NPL). This determination is made using the Hazard Ranking System (HRS). Any site eligible for placement on the NPL must have an overall score of at least 28.5. Additional investigations in the form of a Screening Site Inspection (SSI) and/or an Expanded Site Inspection (ESI) are conducted for those sites whose preliminary HRS score is greater than 28.5. The site is scored or re-scored after the SSI and/or ESI to determine its eligibility for placement on the NPL.

The goal of an FSIP is to gather any additional information necessary, following the completion of the SSI (prior to implementation of the revised HRS), to help set priorities among the sites for NPL listing, or to screen them from further Superfund attention. FSIPs can be performed on sites that have SSI completion dates prior to 1 August 1992 in CERCLIS, because these sites were most likely not evaluated using the revised HRS model. The FSIPs are conducted using the revised HRS model, which was promulgated and published in the Federal Register (55 FR 51432) in December 1990 and which supersedes the original HRS.

If the existing information supports the determination that additional investigation is not necessary, the site is designated as requiring no further remedial action (NFRAP). Sites can also be NFRAPed without scoring if the following conditions exist:

CH01\PUBLIC\WO\ARCS\040\1831LS-1

1-1

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

- No waste is present at the site
- The site is one at which the only known or suspected releases to the environment are due to petroleum products.
- The site is regulated under the Resource Conservation and Recovery Act (RCRA).

Once a site is NFRAPed, it is removed from the CERCLIS list if no other Federal actions are pending at the site. A site warranting further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments Reauthorization Act (SARA) authority may be considered a candidate for the NPL, and a HRS scoring package may be prepared after the FSIP, if the resulting data are sufficient. Other sites may require additional investigation (i.e., an ESI) to collect specific sampling data and target information to support the HRS score of 28.50 or greater, which is necessary to propose a site for the NPL.

The Vulcan Materials Company site was initially evaluated in the form of a Preliminary Assessment (PA) that was submitted to the U.S. EPA. The PA was prepared by the Indiana State Board of Health (ISBH) on 2 March 1984 (Reference 1). A Site Inspection (SI) was conducted by Ecology and Environment (E&E) on 10 May 1984, and the SI report was completed on 16 May 1984 (Reference 2). WESTON prepared a Site Specific Implementation Plan (SSIP) for this FSIP that was approved by the U.S. EPA on 19 April 1995 (Reference 3).

The FSIP included an interview with site representatives, a reconnaissance inspection of the site, and the collection of six soil samples and four sediment samples. The field sampling was conducted on 17 and 18 August 1995. Deviations from the U.S. EPA-approved SSIP were necessary during the field sampling because of the presence of a concrete pad and debris (i.e., rocks, construction debris, scrap metal) in the subsurface soil. Several sample locations were relocated or eliminated after consultation with the U.S. EPA Work Assignment Manager (WAM).

SECTION 2

SITE BACKGROUND

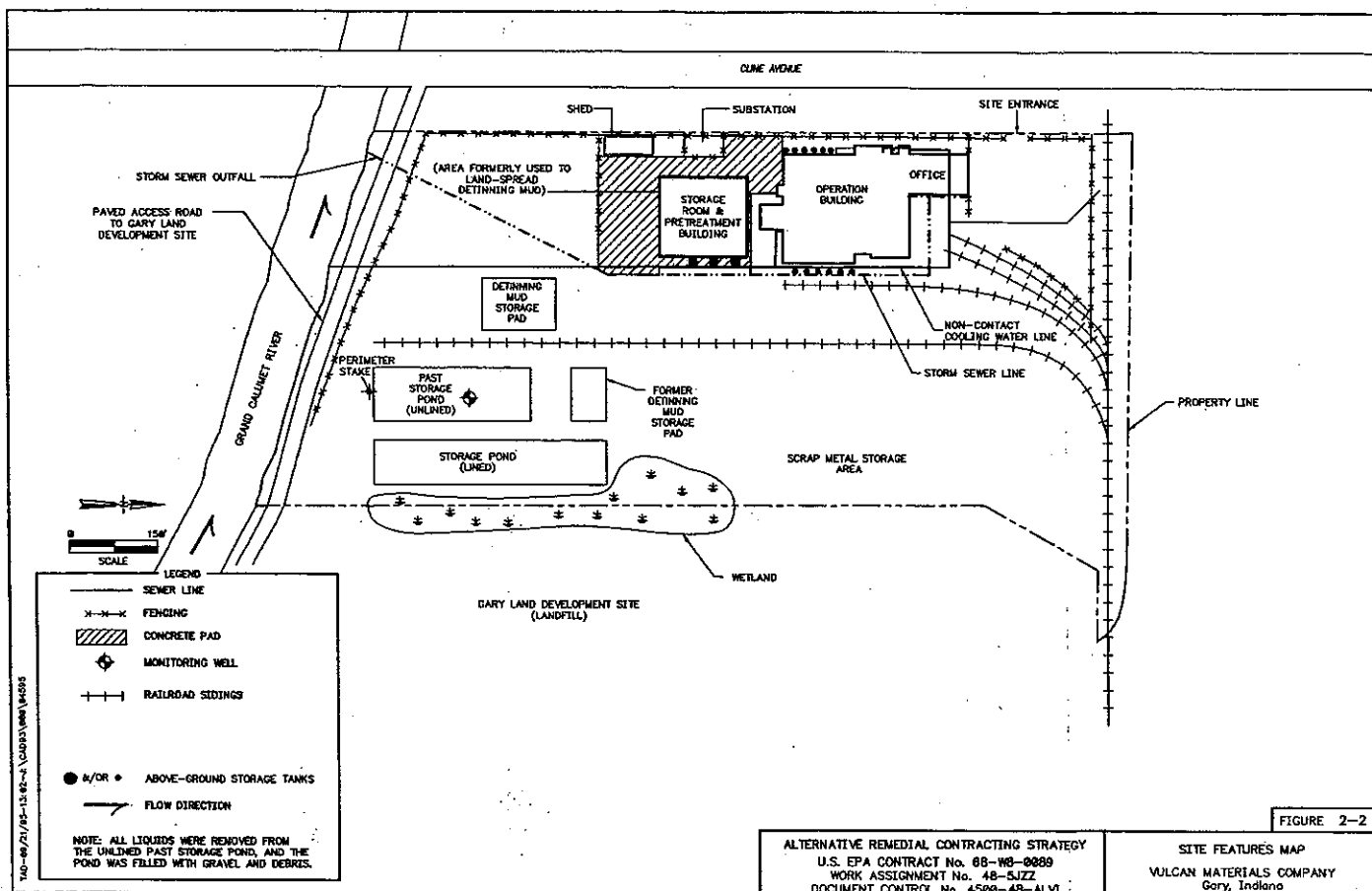
This section presents information regarding the location, the history, the operational history and waste characteristics, the prior investigations and the reconnaissance inspection of the site.

2.1 SITE LOCATION

The Vulcan Materials Company site is an active scrap steel detinning facility located at 459 North Cline Avenue in Gary, Indiana (Reference 1). The facility is currently owned and operated by AMG Resources Corporation of Pittsburgh, Pennsylvania. The site is bounded by Cline Avenue to the west, wetlands to the north, the Gary Land Development (GLD) landfill to the east, and the Grand Calumet River to the south. A site location map is provided in Figure 2-1. A 4-mile radius map is presented in Appendix A (References 4, 5, 6, 7, 8).

2.2 SITE DESCRIPTION

The site consists of an operational building, several auxiliary structures in the northwestern section, and two storage ponds (lined and unlined) in the southeastern section of the property. An area south of the main building was formerly used for land-spreading of detinning mud. A single monitoring well is located within the boundaries of the former unlined storage pond. The site is only partially fenced and is accessible from the GLD landfill road which runs along the southwestern corner of the property. The entire site is approximately 23 acres in area (Reference 2). A site features map is provided in Figure 2-2.



2.3 OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

The Vulcan Materials Company site is a steel detinning facility. The detinning process involves the stripping of tin from the tin-plated scrap steel by immersing the steel in a heated 5 to 6 percent caustic solution with sodium nitrate as an oxidizing agent. The detinned steel is pressed and resold to steel mills. The solution containing the tin is replated, melted, and cast into 100 pound pigs (Reference 2).

From 1955 to 1980, the caustic mud slurry from the detinning operation was placed in an unlined storage pond for the evaporation of water. The concentrated mud was sold to a Texas firm for reprocessing. In 1979, by order of the ISBH, the unlined storage pond was closed, dredged, and filled. A lined storage pond was constructed adjacent to the unlined storage pond. Twelve spray nozzles were installed in this pond to facilitate evaporation (Reference 2). In 1980, the Texas firm that purchased the concentrated mud went out of business. As a result, the dewatered, concentrated mud was land-spread in the southwest corner of the property (Reference 2).

On 10 December 1979, the GLD landfill operator notified the ISBH of leachate flow from the Vulcan Materials Company site. U.S. EPA personnel inspected the GLD landfill site on three occasions (24 January, 27 March, and 31 March 1980). Water samples were collected from the GLD landfill borrow pit and the lined storage pond at the Vulcan Materials Company site. The water samples were analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). Based on the water sampling analytical results, no direct correlation could be made to indicate that leachate was flowing from the Vulcan Materials Company storage pond to the GLD landfill borrow pit (Reference 2).

2.4 PRIOR INVESTIGATIONS

In 1981, D'Appolonia Consulting Engineers, Inc. was contracted by the Vulcan Materials Company to conduct a preliminary hydrogeological investigation (Reference 9). This investigation was performed in accordance with an Agreed Order between the U.S. EPA and the Vulcan Materials Company. During this investigation, samples were collected from three soil borings located near the surface impoundments at a depth of 11 to 17.5 feet below ground surface (bgs). Three water samples, one from each location, were collected from the lined storage pond, the unlined storage pond, and the sewer outfall in the Grand Calumet River. According to the D'Appolonia report, analytical results from the water sample in the lined pond indicated that barium, chromium, iron, lead, and mercury exceeded the primary drinking water standards for these metals. The analytical results from the water samples collected from the unlined pond and the sewer outfall did not exceed drinking water standards. Analytical results from subsurface soil samples indicated that the Extraction Procedure (EP) toxicity metal concentrations were below the regulatory limits (Reference 9).

A PA of the site was performed by the ISBH on 2 March 1984 (Reference 1). A Site Inspection (SI) was conducted by E&E on 10 May, 1984. The SI Report was completed by E&E on 16 May 1994 (Reference 2). The SI consisted of a site visit and an interview with Mr. L.D. Travis and Mr. George Hanny of the Vulcan Materials Company. No samples were collected during the SI.

2.5 SITE RECONNAISSANCE INSPECTION

On 17 January 1995, Mr. Dan Briller and Ms. Terry Bosko of WESTON conducted a reconnaissance inspection at the site. During the site reconnaissance, the sources at the site were identified, sample locations were determined, migration pathways were identified, and the length of the overland flow segment from the site to the Grand Calumet River was determined. The following observations were made during the reconnaissance inspection:

CH01\PUBLIC\WO\ARCS\040\1831LS-2

2-5

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

- A total of 40 people are currently employed at the site.
- According to a representative of AMG Resources, all liquid wastes (an alleged total of 1.2 million gallons) were removed from the unlined storage pond in 1980, and the storage pond was filled with gravel and construction debris. During the site reconnaissance, it was observed that this storage pond has been completely filled in.
- The area south of the operation building that was formerly used for land disposal of detinning mud has been covered with asphalt pavement. A baling press for scrap metal is now located in this area. The area is rectangular in shape and measures approximately 130 feet by 145 feet.
- The facility currently has RCRA-generator status, due to the generation of a waste electrolyte that is classified as a hazardous waste based on its corrosivity (pH).
- According to the AMG Resources representative, in 1989 the lined storage pond was used to store an aqueous caustic solution. This material has since been removed. The storage pond now captures stormwater runoff from the southeastern portion of the site. During the site reconnaissance, the storage pond was observed to be partially filled with ice.
- The facility has a National Pollutant Discharge Elimination (NPDES) permit for discharge of non-contact cooling water and stormwater into the Grand Calumet River. Parameters sampled under this permit include BOD₅, chlorides, oil and grease, sulfates, temperature, total dissolved solids, and total suspended solids.
- A single monitoring well is located within the boundaries of the former unlined storage pond. This well was installed and sampled during a property transfer-related site investigation in December 1987. The well has not been sampled since 1987, and no regular groundwater monitoring is conducted on site.
- An area of wetlands extends from the furthest-most upstream portion of the site to downstream along the near bank of the Grand Calumet River. The total frontage for this wetlands in the Grand Calumet River is approximately 600 feet. Cattails and other marsh vegetation were observed in this area.
- The Gary Land Development Company landfill site (IND077005916) is located immediately adjacent to the site, on the east, and is approximately 100 feet upstream from the point at which the surface runoff from the Vulcan Materials Company site enters the Grand Calumet River.

- The site is only partially fenced and is accessible from the GLD access road along the southwestern corner of the site. Workers are present at the facility 24 hours per day and a security service is employed during the off-hours.
- The only vegetation present at the site is located at the extreme southern end of the site bordering the Gary Land Development access road. The remainder of the site (the areas actively used by AMG Resources) are either covered with dirt or asphalt pavement.
- No engineered final cover systems have been installed above the potential sources at the site. The area formerly used for landspreading detinning mud has been covered with asphalt pavement and the unlined storage pond has been filled in and covered with gravel and construction debris. The lined storage pond is in active use and has no cover.
- The former detinning-mud storage pad and the present detinning-mud storage pad are covered with asphalt pavement. An asphalt berm is also located around the perimeter of the present detinning-mud storage pad.
- No run-on control or runoff collection systems have been installed at the site, except for the asphalt berm around the present detinning mud storage pad. All runoff from the potential on-site sources flows overland toward the Grand Calumet River. The on-site storm sewer system collects runoff from the process building roof and non-contact cooling water which discharges into the Grand Calumet River via an outfall.

Per the U.S. EPA, Form 2070-13 has not been included with this report because it was completed during the E&E SI. Photographic documentation of the site reconnaissance inspection is provided in Appendix B.

SECTION 3

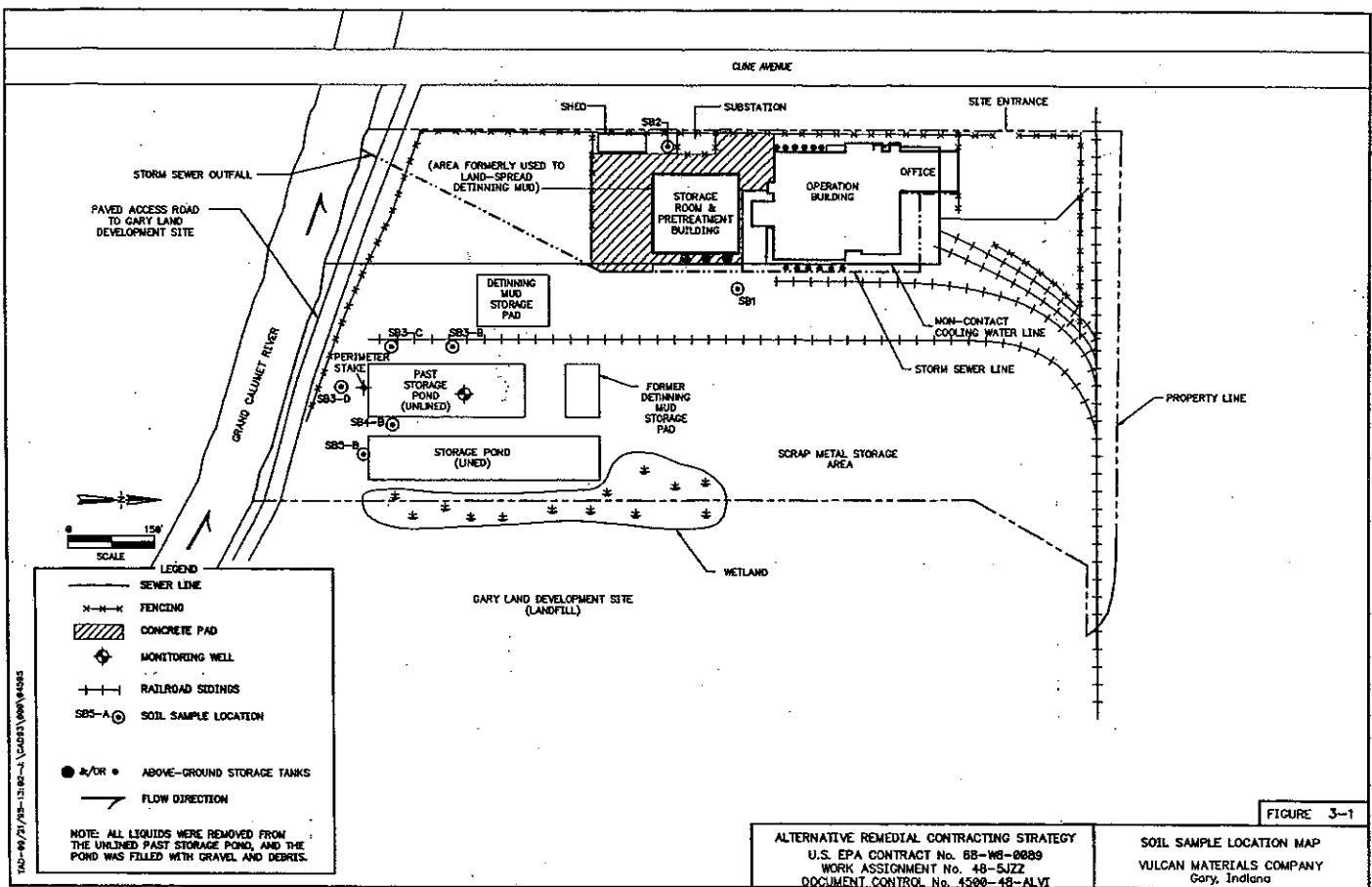
SOURCE SAMPLING

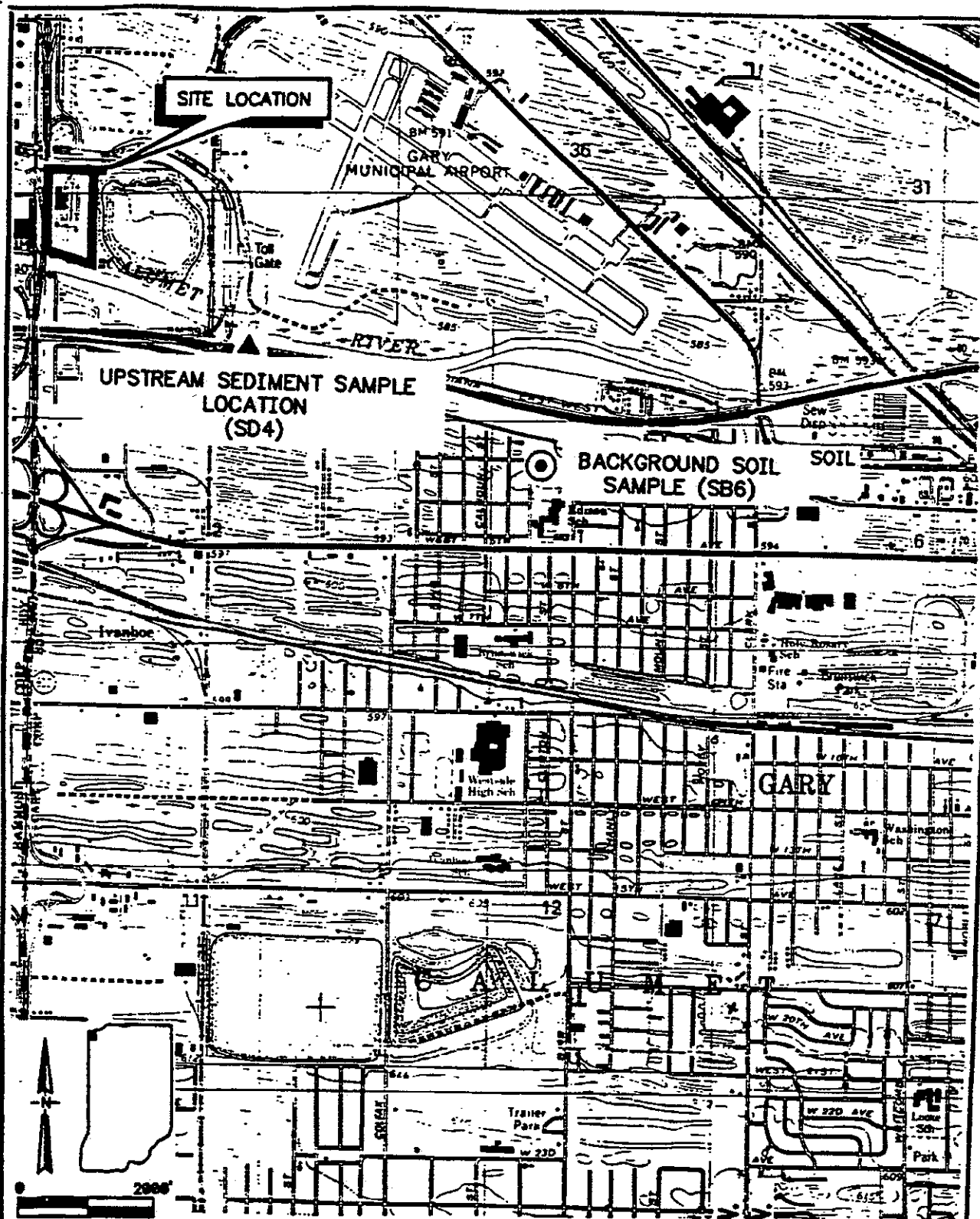
This section discusses the soil sampling locations, the rationale for sample collection, the sampling procedures, and the analytical results of soil sampling. Photographs of site sampling are presented in Appendix B. A list of Target Compound List (TCL) compounds and Target Analyte List (TAL) analytes, including their quantitation/detection limits, is presented in Appendix C.

3.1 SOIL SAMPLE LOCATIONS

The purpose of the soil sampling was to characterize the area impacted by site operations. The following alleged or potential dumping areas of the site were selected for sampling: former landspreading areas, the unlined storage pond, and the lined storage pond. Figure 3-1 presents the soil sampling locations. Figure 3-2 shows the location of the background soil sample. The sample location, the rationale, and the Contract Laboratory Program (CLP) traffic report numbers are provided in Table 3-1. Deviations from the U.S. EPA-approved SSIP were necessary during this FSIP investigation due to the presence of a concrete pad and debris (i.e., rocks, construction debris, scrap metal) in the subsurface soil. The following sample locations were relocated or eliminated after consultation with the U.S. EPA WAM:

- According to the U.S. EPA-approved SSIP, subsurface soil samples FSIVM-SB01-01 (SB1) and FSIVM-SB02-01 (SB2) were to be obtained as composite subsurface soil samples consisting of soil samples collected from two discrete sampling locations SB1-A and SB1-B and SB2-A and SB2-B respectively, located along the perimeter of the former land-spreading area. Subsurface soil samples SB1-A and SB2-B were not collected because the concrete pad prohibited sampling at these locations. The concrete pad also prohibited sampling at locations SB1-B and SB2-A; however, these samples were relocated. Subsurface soil sample SB1-B was collected approximately 20 feet east of the above ground storage tank area and 45 feet north of the concrete pad. Subsurface soil sample SB2-A was collected approximately 40 feet east of the western property fence, 10 feet west of the concrete pad, and 5 feet





SOURCE: U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP HIGHLAND, INDIANA QUADRANGLE

FIGURE 3-2

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY

U.S. EPA CONTRACT No. 68-W8-0089

WORK ASSIGNMENT No. 48-SJZZ

DOCUMENT CONTROL No. 4500-48-ALVI

**BACKGROUND SOIL AND SEDIMENT
SAMPLE LOCATION MAP**

VULCAN MATERIALS COMPANY
Gary, Indiana

Table 3-1

**Subsurface Soil Sampling Locations and Rationale
Vulcan Materials Company
Gary, Indiana**

Field Sample Number	Traffic Report Number		Sample Type	Location and Rationale	Depth (ft)	Date of Collection	Time of Collection
	Organic	Inorganic					
FSIVM-SB01-01	ESS75	MEYK85	Soil (Grab)	Northeast of the former landfarming area, 20 feet east of the aboveground storage tank area and 45 feet north of the concrete pad to characterize the soil in this area.	3 - 4	5/18/95	13:15
FSIVM-SB02-01MSD	ESS76	MEYK86	Soil (Grab)	Southwest of the former landfarming area, 40 feet east of the property fence, 10 feet west of the concrete pad area, 5 feet south of the substation to identify any contaminants migrating from this source.	3 - 4	5/17/95	18:25
FSIVM-SB03-01	ESS77	MEYK87	Soil (Composite)	Composite subsurface soil sample collected at the following three discrete sampling locations to characterize the soil around the unlined storage pond. SB3-B: West of the unlined storage pond, 132 feet north of the perimeter stake and 6 feet east of the railroad spur. SB3-C: Southwest of the storage pond, 42 feet north of the perimeter stake, and 19 feet east of the railroad spur. SD3-D: South of the unlined storage pond, 32 feet south the perimeter stake, 30 feet east of the railroad spur, 55 feet north of the property fence, and 145 feet west of the west side of the lined storage pond.	3 - 4	5/17/95	16:30

CH01\PUBLIC\WO\ARCS\040\18311T.3-1

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 3-1

**Subsurface Soil Sampling Locations and Rationale
Vulcan Materials Company
Gary, Indiana
(Continued)**

Field Sample Number	Traffic Report Number		Sample Type	Location and Rationale	Depth (ft)	Date of Collection	Time of Collection
	Organic	Inorganic					
FSIVM-SB04-01	ESS78	MEYK88	Soil (Grab)	West of the lined storage pond, east of the unlined storage pond, 83 feet north of the perimeter stake, 13 feet west of the west side of the lined storage pond to identify any contaminants migrating from the storage ponds.	3 - 4	5/17/95	17:05
FSIVM-SB04-01DP	ESS79	MEYK89	Soil (Grab)	Duplicate of FSIVM-SB04-01.	3 - 4	5/17/95	17:05
FSIVM-SB05-01	ESS80	MEYK90	Soil (Grab)	South of the lined storage pond, 5 feet south of the lined storage pond, 41 feet north of the GLD access road, 25 feet south of the south side of the lined storage pond to characterize the soil around the lined storage pond.	3 - 4	5/17/95	17:45
FSIVM-SB06-01	ESS81	MEYK91	Soil (Grab)	From Edison Elementary School to establish background concentrations.	3 - 4	5/18/95	11:00

CH01\PUBLIC\WO\ARCS\040\18311T3-1

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

south of the substation. SB1-B and SB2-A were grab samples and were designated as SB1 and SB2, respectively.

- Sample FSIVM-SB03-01 (SB3) originally included a discrete soil sample, SB-3A, to be collected from the northern perimeter of the unlined storage pond. Discrete soil sample SB3-A could not be collected because subsurface interference (i.e., rocks, construction debris) prohibited the advancement of the power auger. Furthermore, discrete soil samples SB3-B, SB3-C, and SB3-D were relocated away from the unlined storage pond because the subsurface interference also prohibited the advancement of the power auger at these locations.
- Sample FSIVM-SB04-01 (SB4) was to be collected as a composite soil sample consisting of soil samples from two discrete locations, SB4-A and SB4-B. Discrete soil sample SB4-A could not be collected because subsurface interference (i.e., rocks, construction debris) prohibited the advancement of the power auger.
- Soil sample FSIVM-SB05-01 (SB5) was to be collected as a composite soil sample consisting of three discrete soil samples SB5-A, SB5-B, and SB5-C collected from the northern, the western, and the eastern perimeters of the lined storage pond, respectively. However, discrete soils samples SB5-A and SB5-C were not collected because these samples were located in a wetland which received run-off from the adjacent GLD landfill. A berm was also present between the wetland and the lined storage pond which prohibited sample collection.

Subsurface soil samples SB1 and SB2 were collected from the northeastern and southwestern perimeters of the former landspreading area, respectively. Subsurface soil sample SB2 was also designated as the matrix spike/matrix spike duplicate (MS/MSD) sample.

Subsurface soil samples SB3, SB4, and SB5 were collected from the areas surrounding the unlined and the lined storage ponds. Subsurface soil sample SB3 was a composite soil sample consisting of three discrete samples (SB3-B, SB3-C, and SB3-D) collected from the northwestern, the southwestern, and the southern perimeters of the unlined storage pond, respectively.

Subsurface soil sample SB4 was a grab soil sample collected from the southeastern perimeter of the unlined storage pond. Subsurface soil sample FSIVM-SB04-01DP (SB4-DP) was a field duplicate collected at the same location as SB4.

Subsurface soil sample SB5 was collected from outside the containment berm south of the lined storage pond.

The background soil sample FSIVM-SB06-01 (SB6) was collected from the Edison School located approximately 1.25 miles southeast of the site. According to the USDA Soil Survey for Lake County (Reference 10), soil from the Edison School and the site property belong to the Oakville-Tawas association. The background soil sample was also collected at a depth of 3 to 4 feet bgs, corresponding to the depth of the soil samples collected at the site.

3.2 SOIL SAMPLING PROCEDURES

Soil samples SB1 through SB6 were collected at a depth of 3 to 4 feet bgs. For the grab soil samples, the VOC analysis soil sample aliquot was collected first as a grab sample to minimize the loss of volatiles. The soil sample for VOC analysis was removed from the hand auger using a decontaminated stainless steel scoop and placed into the VOC sample container immediately without mixing. The remaining sample material from the hand auger was then placed in a stainless steel bowl and mixed with a stainless steel scoop. Mixing was continued until a sample homogeneity (same color and texture) was achieved. The sample was then transferred into the respective sample bottles for SVOCs, pesticides/polychlorinated biphenyls (PCBs), and inorganic analysis. For the composite soil samples, the discrete soil samples (SB3-B, SB3-C, and SB3-D) were homogenized into one composite soil sample (SB3) for all analysis except VOC analysis. For VOC analysis, an approximate equal portion of soil collected from each discrete soil sampling location was immediately placed into one sampling jar to minimize volatilization. Standard decontamination procedures indicated in the U.S. EPA-approved Quality Assurance Project Plan (QAPP) were followed during the collection of all soil samples (Reference 11). All

CH01\PUBLIC\WO\ARCS\040\18311.S-3

3-7

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

samples were packaged and shipped in accordance with procedures included in the U.S. EPA QAPP.

Soil samples were analyzed through the U.S. EPA CLP for TCL compounds by Compuchem Environmental Corporation, Inc. in Research Triangle Park, North Carolina and for TAL analytes by Southwest Laboratories of Oklahoma in Broken Arrow, Oklahoma.

3.3 ANALYTICAL RESULTS

A summary of the analytical results from subsurface soil sampling is presented in Table 3-2. Analytical results indicated the presence of acetone and 4,4'-DDE in the background sample SB6 at estimated concentrations of 83 micrograms per kilogram ($\mu\text{g/kg}$) and $0.12 \mu\text{g/kg}$, respectively. Several metals were detected in the background soil sample. SVOCs, PCBs, and cyanide were not detected in the background soil sample.

Analytical results indicated the presence of acetone at an estimated concentration of $24 \mu\text{g/kg}$ in sample SB1. No SVOCs were detected in soil sample SB1. Pesticides at estimated concentrations ranging from 0.14 to $0.74 \mu\text{g/kg}$ were detected in soil sample SB1. Aroclor-1254, at an estimated concentration of $27 \mu\text{g/kg}$, was also detected in soil sample SB1. No VOCs were detected in soil sample SB2. SVOCs, at estimated concentrations ranging from 38 to $94 \mu\text{g/kg}$, were detected in soil sample SB2. Pesticides, at estimated concentrations of 0.048 to $0.69 \mu\text{g/kg}$, were detected in soil sample SB2.

The analytical results of composite soil sample SB3 indicated the presence of tetrachloroethene and acetone at estimated concentrations of $2 \mu\text{g/kg}$ and $34 \mu\text{g/kg}$, respectively. SVOCs were detected in sample SB3 at estimated concentrations ranging from $41 \mu\text{g/kg}$ to $2,500 \mu\text{g/kg}$. Pesticides, except gamma-chlordane, were detected in sample SB3 at estimated concentrations of $0.12 \mu\text{g/kg}$ to $3.4 \mu\text{g/kg}$. Gamma-chlordane was detected in sample SB3 at a concentration of $2.4 \mu\text{g/kg}$. Cyanide was detected in this soil sample at a concentration of 0.61 milligrams/kilogram (mg/kg). No PCBs were detected in soil

Table 3-2

**Subsurface Soil Sampling Results
Vulcan Material Company
Gary, Indiana**

Parameters	Field Sample Numbers						
	FSIVM-SB01-01	FSIVM-SB02-01	FSIVM-SB03-01**	FSIVM-SB04-01	FSIVM-SB04-01DP**	FSIVM-SB05-01	FSIVM-SB06-01 (Background)
Volatiles (µg/kg)							
Tetrachloroethene	—	—	2 J	—	—	—	—
Acetone	24 J	—	34 J	—	—	—	83 J
Semivolatiles (µg/kg)							
Isophorone	—	—	—	6,200 JD	—	—	—
Naphthalene	—	—	41 J	58 J	46 J	—	—
2-Methylnaphthalene	—	—	190 J	610 J	110 J	—	—
Acenaphthene	—	—	280 J	—	—	—	—
Fluorene	—	—	130 J	88 J	—	—	—
Phenanthrene	—	73 J	780 J	120 J	120 J	—	—
Anthracene	—	—	180 J	—	—	—	—
Carbazole	—	—	65 J	—	—	—	—
Fluoranthene	—	91 J	1,000 J	89 J	120 J	—	—
Pyrene	—	94 J	2,500 J	180 J	400 J	48 J	—
Butylbenzylphthalate	—	—	130 J	—	42 J	—	—
Benzo(a)anthracene	—	38 J	720 J	58 J	120 J	—	—
Chrysene	—	47 J	720 J	92 J	180 J	—	—
bis(2-ethylhexyl)phthalate	—	64 J	380 J	370 J	460 J	—	—
Di-n-octylphthalate	—	52 J	—	—	61 J	—	—
Benzo(b)fluoranthene	—	69 J	1,000 J	140 J	250 J	51 J	—
Benzo(k)fluoranthene	—	71 J	1,000 J	150 J	260 J	52 J	—
Benzo(a)pyrene	—	—	670 J	80 J	160 J	—	—
Indeno(1,2,3-cd)pyrene	—	—	430 J	65 J	170 J	—	—

CH01\PUBLIC\WO\ARCS\040\18311T.3-2

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., exp

or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 3-2

**Subsurface Soil Sampling Results
Vulcan Material Company
Gary, Indiana
(Continued)**

Parameters	Field Sample Numbers						
	FSIVM-SB01-01	FSIVM-SB02-01	FSIVM-SB03-01**	FSIVM-SB04-01	FSIVM-SB04-01DP**	FSIVM-SB05-01	FSIVM-SB06-01 (Background)
Semivolatiles (µg/kg) (Cont.)							
Dibenzo(a,h)anthracene	—	—	120 J	—	39 J	—	—
Benzo(g,h,i)perylene	—	—	520 J	92 J	220 J	—	—
Pesticides/PCBs (µg/kg)							
alpha-BHC	—	0.048 JP	—	—	—	—	—
delta-BHC	—	—	0.17 JP	0.094 JP	—	—	—
Aldrin	—	—	1.2 JP	—	0.16 JP	—	—
Heptachlor epoxide	—	0.25 JP	—	—	1.2 JP	—	—
Endosulfan I	—	—	0.73 JP	0.34 J	—	—	—
Dieldrin	0.14 JP	0.25 JP	0.41 JP	0.19 JP	0.42 JP	0.20 JP	—
4,4'-DDE	0.28 JP	0.10 JP	0.26 JP	0.075 JP	1.2 JP	0.42 JP	0.12 JP
Endosulfan II	—	0.28 JP	0.93 JP	—	—	—	—
4,4'-DDD	0.74 J	—	0.12 JP	—	0.64 JP	0.24 J	—
Endosulfan sulfate	—	0.28 J	1.5 JP	0.50 JP	3.4 JP	0.29 JP	—
4,4'-DDT	0.28 JP	0.56 JP	1.8 JP	0.65 JP	0.95 JP	0.34 J	—
Methoxychlor	0.25 JP	—	0.25 JP	—	1.5 JP	0.48 JP	—
Endrin ketone	—	—	3.4 JP	—	—	—	—
Endrin aldehyde	—	0.69 JP	—	0.33 JP	1.6 J	0.24 J	—
alpha-chlordane	—	—	0.47 JP	—	0.82 JP	—	—
gamma-chlordane	—	0.13 JP	2.4 P	—	0.23 JP	—	—
Aroclor-1254	27 J	—	—	—	—	—	—

CH01\PUBLIC\WO\ARCS\040\18311T.3-2

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 3-2

**Subsurface Soil Sampling Results
Vulcan Material Company
Gary, Indiana
(Continued)**

Parameters	Field Sample Numbers						
	FSIVM-SB01-01	FSIVM-SB02-01	FSIVM-SB03-01**	FSIVM-SB04-01	FSIVM-SB04-01DP**	FSIVM-SB05-01	FSIVM-SB06-01 (Background)
Inorganics (mg/kg)							
Aluminum	1,210	1,190	5,330	4,470	4,820	811	632
Antimony	—	—	0.70 B	—	—	—	—
Arsenic	3.3	1.6 B	8.9	2.8	2.6	—	—
Barium	15.5 B	19.1 B	155	39.0 B	45.8	6.0 B	4.2 B
Beryllium	—	—	0.72 B	0.29 B	0.26 B	—	—
Cadmium	0.50 B	—	1.2	0.48 B	0.49 B	—	—
Calcium	3,880	35,100	37,300	22,100	20,700	980 B	507 B
Chromium	3.4	9.0	38.9	13.0	11.8	2.8	1.9 B
Cobalt	1.8 B	2.8 B	4.7B	2.2 B	2.4 B	0.93 B	0.8 B
Copper	9.3	11.0	83.7	11.2	8.9	3.7 B	0.8 B
Iron	3,510	6,500	28,600	8,060	8,300	1,770	1,350
Lead	48.1 JN*	153 JN*	814 JN*	336JN*	348 JN*	11.8 JN*	2.2 JN*
Magnesium	1,510 *	18,200 *	12,400 *	9,530 J*	9,140 *	377 B*	287 B*
Manganese	85.7 JN	162 JN	646 JN	240 JN	202 JN	28.5 JN	20.5 JN
Mercury	—	—	0.16	—	0.16	—	—
Nickel	2.7 B	4.6 B	18.5	6.6 B	5.9 B	1.5 B	1.2 B
Potassium	140 B	140 B	459 B	232 B	280 B	81.3 B	103 B
Selenium	—	—	1.9	—	—	—	—
Silver	—	—	0.38 B	—	—	—	—
Sodium	1,210	127 B	1,880	182 B	168 B	59.5 B	57.4 B
Thallium	—	—	1.3 B	1.4 B	—	—	—

CH01\PUBLIC\WO\ARCS\040\18311T3-2

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 3-2

**Subsurface Soil Sampling Results
Vulcan Material Company
Gary, Indiana
(Continued)**

Parameters	Field Sample Numbers						
	FSIVM-SB01-01	FSIVM-SB02-01	FSIVM-SB03-01**	FSIVM-SB04-01	FSIVM-SB04-01DP**	FSIVM-SB05-01	FSIVM-SB06-01 (Background)
Inorganics (mg/kg) (Cont.)							
Vanadium	2.7 B	3.4 B	12.6	3.9 B	4.7 B	2.1 B	1.8 B
Zinc	111 JN*	183 JN*	749 JN*	253 JN*	251 JN*	22.3 JN*	8.7 JN*
Cyanide	—	—	0.61	—	—	—	—

Organics

J - The associated value is an estimated quantity.

P - This flag is used for pesticide/Aroclor target analytes when there is greater than 25% difference for detected concentrations between the two columns.

** - Analytical results from the reparation sample for the semivolatile organic compound analyses were reported because area counts and retention times were not within the required QC limits for these samples.

— - Not detected above CRDL/SQL.

Inorganics:

B - The associated value is <CRDL to ≥IDL.

J - The associated value is an estimated quantity.

N - Spiked sample recovery not within control limits.

* - Indicates the duplicate analysis is not within control limits.

— - Not detected above CRDL/SQL.

CH01\PUBLIC\WO\ARCS\040\18311T.3-2

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

sample SB3. VOCs, pesticides, and cyanide were not detected in soil sample SB4. SVOCs were detected in sample SB4 at estimated concentrations of 58 $\mu\text{g/kg}$ to 6,200 $\mu\text{g/kg}$. Several pesticides were detected in sample SB4 at estimated concentrations of 0.16 $\mu\text{g/kg}$ to 1.6 $\mu\text{g/kg}$. Cyanide and PCBs were not detected in sample SB4.

VOCs, PCBs, and cyanide were not detected in soil sample SB5. Pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene were present in sample SB5 at estimated concentrations of 48 $\mu\text{g/kg}$, 51 $\mu\text{g/kg}$, and 52 $\mu\text{g/kg}$, respectively. Several pesticides were also present in soil sample SB5 at concentrations ranging from 0.2 $\mu\text{g/kg}$ to 0.48 $\mu\text{g/kg}$.

The key analytical findings of subsurface soil sampling are presented in Table 3-3. Lead was the only metal detected at concentrations greater than three times the background concentration in all on-site soil samples. Several other metals, as described below, were also detected in the on-site soil samples at concentrations greater than three times the background concentration:

- Copper, manganese, magnesium, and zinc in all on-site soil samples except SB5.
- Arsenic in all on-site soil samples except SB2, SB3, and SB5.
- Chromium in all on-site samples except SB1 and SB5.
- Barium and mercury in soil samples SB3 and SB4.
- Aluminum in soil samples SB3, SB4, and SB4-DP.
- Cadmium, nickel, selenium, and vanadium in soil sample SB3.

3.4 SUMMARY

The on-site soil sampling conducted during the FSIP indicates that the on-site soil has been impacted by low levels of VOCs and pesticides. PCBs were detected only at location SB1. However, the on-site soil is significantly impacted by SVOCs and metals. The presence of

Table 3-3

**Key Analytical Findings of Subsurface Soil Sampling
Vulcan Materials
Gary, Indiana**

Sample I.D.	Depth (ft)	Location	Units	Compound	Concentration	Background Concentration (SB06-01)
FSIVM-SB01-01	3 - 4	Northeast of the former landfarming area, 20 feet east of the aboveground storage tank area and 45 feet north of the concrete pad.	mg/kg	Arsenic	3.3	<1.3
				Calcium	3,880	507 B
				Copper	9.3	0.81 B
				Lead	48.1 JN*	2.2 JN*
				Magnesium	1,510*	287 B*
				Manganese	85.7 JN	20.5 JN
				Sodium	1,210	57.4 B
				Zinc	111 JN*	8.7 JN*
FSIVM-SB02-01	3 - 4	Southwest of the former landfarming area, 40 feet east of the property fence, 10 feet west of the concrete pad, and 5 feet south of the substation.	mg/kg	Calcium	35,100	507 B
				Chromium	9.0	1.9 B
				Copper	11.0	0.8 B
				Iron	6,500	1,350
				Lead	153 JN*	2.2 JN*
				Magnesium	18,200*	287 B*
				Manganese	162 JN	20.5 JN
				Zinc	183 JN*	8.7 JN*

CH01\PUBLIC\WO\ARCS\040\18311T.3-3

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 3-3
Key Analytical Findings of Subsurface Soil Sampling
Vulcan Materials
Gary, Indiana
(Continued)

Sample I.D.	Depth (ft)	Location	Units	Compound	Concentration	Background Concentration (SB06-01)
FSIVM-SB03-01**	3 - 3.5	Composite subsurface soil sample collected at the following discrete sampling locations.	µg/kg	Phenanthrene	780 J	<430
				Fluoranthene	1,000 J	<430
				Pyrene	2,500 J	<430
				Benzo(a)anthracene	720 J	<430
				Chrysene	720 J	<430
				Benzo(b)fluoranthene	1,000 J	<430
				Benzo(k)fluoranthene	1,000 J	<430
				Benzo(a)pyrene	670 J	<430
				Indeno(1,2,3-cd)pyrene	430 J	<430
				Benzo(g,h,i)perylene	520 J	<430
			mg/kg	gamma-Chlordane	2.4 P	<2.2
				Aluminum	5,330	632
				Arsenic	8.9	<1.3
				Barium	155	4.2 B
				Cadmium	1.2	<0.26
				Calcium	37,300	507 B
				Chromium	38.9	1.9 B
				Copper	83.7	0.8 B
				Iron	28,600	1,350
				Lead	814 JN*	2.2 JN*
				Magnesium	12,400 *	287 B*
				Manganese	646 JN	20.5 JN
				Mercury	0.16	<0.13
				Nickel	18.5	1.2 B
				Selenium	1.9	<1.0
				Sodium	1,880	57.4 B
				Vanadium	12.6	1.8
				Zinc	749 JN*	8.7 JN*

CH01\PUBLIC\WO\ARCS\040\18311T.3-3

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 3-3
Key Analytical Findings of Subsurface Soil Sampling
Vulcan Materials
Gary, Indiana
(Continued)

Sample I.D.	Depth (ft)	Location	Units	Compound	Concentration	Background Concentration (SB06-01)
FSIVM-SB04-01	3 - 3.5	West of the lined storage pond, east of the unlined storage pond, 83 feet north of the perimeter stake 13 feet west of the west side of the lined storage pond.	μg/kg	Isophorone	6,200 JD	< 430
				2-methylnaphthalene	610 J	< 430
			mg/kg	Aluminum	4,470	632
				Arsenic	2.8	< 1.3
				Calcium	22,100	507 B
				Chromium	13.0	1.9 B
				Copper	11.2	0.8 B
				Iron	8,060	1,350
				Lead	336 JN*	2.2 JN*
				Magnesium	9,530 *J	287 B*
				Manganese	240 JN	20.5 JN
				Zinc	251 JN*	8.75 JN*
FSIVM-SB04-01DP**	3 - 3.5	Duplicate of FSIVM-SB04-01.	μg/kg	Bis(2-ethylhexyl)phthalate	460 J	< 430
				4,4'-DDE	1.2 JP	0.12 JP
			mg/kg	Aluminum	4,820	632
				Arsenic	2.6	< 1.3
				Barium	45.8	4.2 B
				Calcium	20,700	507 B
				Chromium	11.8	1.9 B
				Copper	8.9	0.8 B
				Iron	8,300	1,350
				Lead	348 JN*	2.2 JN*
				Magnesium	9,140 *	287 B*
				Manganese	202 JN	20.5 JN
				Mercury	0.16	< 0.13
				Zinc	251 JN*	8.7 JN*

CH01\PUBLIC\WO\ARCS\040\1831IT-3-3

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 3-3
Key Analytical Findings of Subsurface Soil Sampling
Vulcan Materials
Gary, Indiana
(Continued)

Sample I.D.	Depth (ft)	Location	Units	Compound	Concentration	Background Concentration (SB06-01)
FSIVM-SB05-01	3 - 3.5	South of the lined storage pond, 5 feet north of the property fence, 41 feet north of the GLD access road, 25 feet south of the south side of the lined storage pond.	µg/kg	4,4'-DDE	0.42 JP	0.12 JP
			mg/kg	Lead	11.8 JN*	2.2 JN*

Organics

- J - The associated value is an estimated quantity.
- P - This flag is used for pesticide/Aroclor target analytes when there is greater than 25% difference for detected concentrations between the two columns.
- ** - Analytical results from the reparation sample for the semivolatile organic compound analyses were reported because area counts and retention times were not within the required QC limits for these samples.
- - Not detected above CRDL/SQL.

Inorganics

- B - The associated value is <CRDL to ≥IDL.
- J - The associated value is an estimated quantity.
- N - Spiked sample recovery not within control limits.
- * - Indicates the duplicate analysis is not within control limits.
- - Not detected above CRDL/SQL.

CH01\PUBLIC\WO\ARCS\040\18311T3-3

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

contamination detected in the site soil could not have resulted from the detinning operation being conducted at the site. There is no information in the site history that indicates that wastes other than detinning mud were ever disposed at the site; therefore, the existing subsurface soil contamination cannot, at this time, be attributed to the known history of operations at the site.

SECTION 4

GROUNDWATER PATHWAY

This section discusses the geologic and hydrogeologic setting and the targets near the Vulcan Materials Site. In accordance with the U.S. EPA-approved SSIP, no groundwater samples were collected during the FSIP investigation.

4.1 GEOLOGIC AND HYDROGEOLOGIC SETTINGS

The unconsolidated aquifer system in Lake County is composed of three heterogeneous sand and gravel aquifers designated the Calumet, the Valparaiso, and the Kankakee aquifers. The Kankakee aquifer is hydraulically connected to and partially recharged by the Valparaiso aquifer on the north. There are other isolated minor aquifers in the heterogeneous glacial materials capable of providing water for small industries or farms. These small aquifers have neither the lateral extent nor the production capacity of the three major aquifers. Based on maps illustrating approximate aquifer boundaries, the site may overlie the Calumet aquifer. However, due to its shallow depth and susceptibility to contamination, the Calumet aquifer is no longer a significant source of drinking water within the 4-mile radius of the site (Reference 12).

Two bedrock aquifer systems also exist in Lake County. The shallow bedrock system is composed of Silurian and Devonian limestone, dolomite, and shale. The depth of this system ranges from 15 feet bgs in the Kankakee Outwash Plain to 270 bgs in the Valparaiso Moraine. The aquifer is not a significant source of drinking water within the 4-mile radius of the site. A deep bedrock aquifer system is also present in four sandstone units (Mount Simon, lower Eau Claire, Galesville, and St. Peter formations) at depths exceeding 1,400 feet bgs. Due to its significant depth and the high mineral content of the water, the deep bedrock aquifer system is not utilized for drinking water supplies (Reference 12).

Area well logs indicate that surficial deposits in the immediate vicinity of the site are predominately sand to a depth of 30 to 40 feet bgs. A clay formation (greater than 90 feet thick in some areas) and limestone bedrock are present underneath the sand deposits. The water table of the unconfined sand aquifer in the site area is very shallow (3 to 5 feet bgs). Area well logs are provided in Appendix D.

4.2 TARGETS

All communities within a 4-mile radius of the site obtain their drinking water from surface water intakes in Lake Michigan (References 13, 14, 15). No municipal wells or private wells are located within the 4-mile target distance limit from the site.

4.3 SUMMARY

Since all populations within a 4-mile radius of the site receive their drinking water from surface water intakes in Lake Michigan, the population is not impacted by site operations.

SECTION 5

SURFACE WATERPATHWAY

This section discusses the hydrologic setting, the targets, the rationale for sediment sampling, the procedures used for sediment sampling, and the analytical results of sediment sampling performed during the FSIP. The photographs for sediment samples are provided in Appendix B. The 15-mile downstream map is provided in Appendix E (References 4, 5, 6, 7, 8, 16, 17).

5.1 HYDROLOGIC SETTING

The Grand Calumet River borders the site to the south. The overland flow from the site that enters the Grand Calumet River may travel west along the Grand Calumet River to its confluence with the Indiana Harbor Canal, north along the canal to its confluence with Lake Michigan, and into the lake. However, during periods of high elevations in Lake Michigan or during periods of strong northerly winds, the Harbor Canal flows south into the Grand Calumet, and the Grand Calumet flows in a westerly direction west of its confluence with the canal (Reference 18).

5.2 TARGETS

The targets present along the surface water migration pathway include drinking water intakes, wetlands, and sensitive environments. Table 5-1 lists drinking water intakes, including their distance downstream from the site and the estimated populations served by each one (References 13, 14, 15, 19, 20). Approximately 3.5 miles of wetland frontage exist 15 miles downstream from the site (Reference 21). At least three state endangered species (the Great Egret, the Black Tern, and the Marsh Wren) exist at the Grand Calumet River Tern Site, located approximately 1.5 miles downstream from the site (Reference 22). The list of sensitive environments are presented in Appendix F.

Table 5-1

**Population for Surface Water Intakes
Vulcan Materials Company
Gary, Indiana**

Intake	Distance from Site (miles)	Population
Hammond	9.30	33,273
Amoco Oil	10.00	5,155
East Chicago	11.20	249,594
TOTAL		288,022

5.3 SEDIMENT SAMPLING LOCATIONS

Four sediment samples were collected during the field investigation to determine whether the contaminants detected on-site had migrated into the Grand Calumet River. The sediment sample locations are shown in Figure 5-1. The upstream sediment sample location is shown in Figure 3-2. The sample locations, rationale, and the CLP traffic report numbers are presented in Table 5-2.

Sediment sample FSIVM-SD01-01 (SD1) was collected from the wetlands along the bank of the Grand Calumet River. Sediment sample FSIVM-SD02-01 (SD2) was collected immediately downstream from the storm sewer outfall from the Vulcan Materials Company. Sediment sample FSIVM-SD02-01DP (SD2-P) was a field duplicate collected at the same location as SD2. An additional sediment sample, FSIVM-SD03-01 (SD3), was collected in the Grand Calumet River at the property line between the site and the adjacent Gary Land Development site. Sediment sample SD3 was collected to determine if stormwater runoff or leachate discharge (if any) from the GLD site had impacted the river. Sediment sample SD3 was also designated as the MS/MSD sample.

The upstream sediment sample FSIVM-SD04-01 (SD4) was collected approximately 0.4 miles upstream from the site, adjacent to the west side of the Indiana Toll Road at Cline Avenue.

5.4 SEDIMENT SAMPLING PROCEDURES

All sediment samples were collected from a depth of approximately 0 to 6 inches below sediment surface. Standard QA/QC procedures outlined in the U.S. EPA-approved QAPP for FSIP field activities were followed during the collection of all samples (Reference 11).

For all sediment samples, the VOC analysis sediment sample aliquot was collected first as a grab sample to minimize the loss of volatiles. The sediment samples for VOC analysis

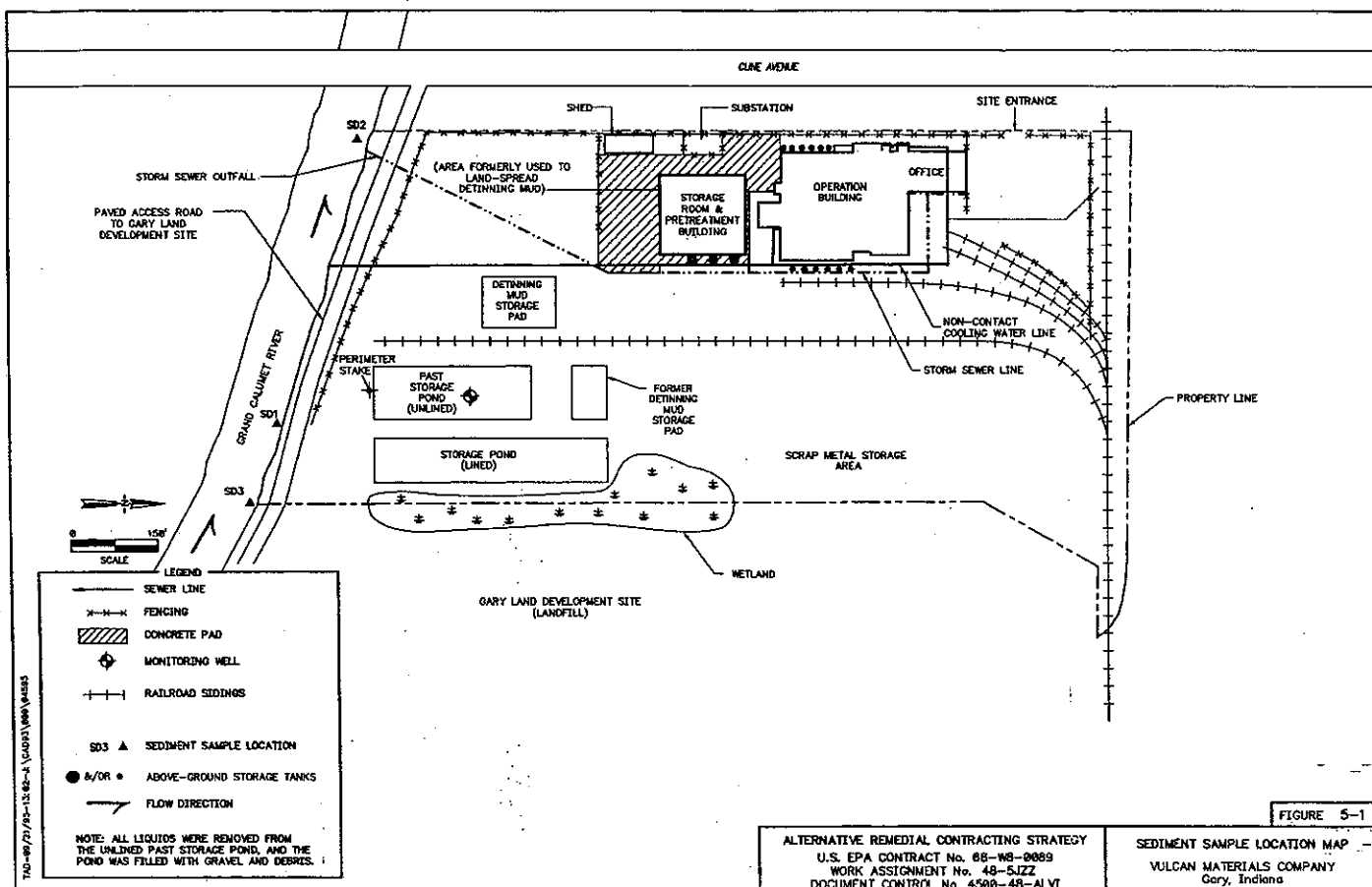


Table 5-2

**Sediment Sampling Locations and Rationale
Vulcan Materials Company
Gary, Indiana**

Field Sample Number	Traffic Report Number		Location and Rationale	Depth (feet)	Date of Collection	Time of Collection
	Organic	Inorganic				
FSVIM-SD01-01	ESS82	MEYK92	Wetland near the Grand Calumet River and adjacent to the site to identify any contaminants migrating from the site	0.5	5/18/95	14:45
FSVIM-SD02-01	ESS83	MEYK93	Downstream of the facility's storm water outfall to identify any contaminants migrating from the site	0.5	5/18/95	14:15
FSVIM-SD02-01DP	ESS84	MEYK94	Duplicate of above	0.5	5/18/95	14:15
FSVIM-SD03-01MSD	ESS85	MEYK95	Upgradient of the site, between the site and the Gary Land Development site to determine the impact by the Gary Land Development site to the Grand Calumet River	0.5	5/18/95	15:05
FSVIM-SD04-01	ESS86	MEYK96	Background — west of the Indiana Toll Road to establish background concentrations	0.5	5/18/95	15:45

CH01\PUBLIC\WO\ARCS\040\18311T.5-2

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

were removed from the hand auger using a decontaminated stainless steel scoop and placed into the VOC sample container immediately without mixing. The remaining sample material from the hand auger was then placed in a stainless steel bowl and mixed with a stainless steel scoop. Mixing was continued until a sample homogeneity (same color and texture) was achieved. The sample was then transferred into the respective sample bottles for SVOCs, pesticides/PCBs, and inorganic analyses. Standard decontamination procedures indicated in the U.S. EPA-approved QAPP were followed during the collection of all sediment samples (Reference 11). All samples were packaged and shipped in accordance with procedures included in the U.S. EPA QAPP.

The sediment samples were analyzed by CLP laboratories for TCL compounds by RECRA Environmental, Inc. in Columbia, Maryland; and for TAL analytes by Southwest Laboratories of Oklahoma in Broken Arrow, Oklahoma.

5.5 ANALYTICAL RESULTS

A summary of the sediment sampling analytical results is presented in Table 5-3. Analytical results indicated that the background sediment sample SD4 detected the presence of several SVOCs, heptachlor epoxide, 4,4'-DDE, endrin ketone, Aroclor 1248, and metals. Analytical results also indicated total xylene at an estimated concentration of 15 $\mu\text{g}/\text{kg}$.

Analytical results indicated the presence of SVOCs, pesticides, Aroclor-1248, and metals in downstream sediment samples SD1, SD2, and SD2-DP. Analytical results also indicated the presence of acetone at an estimated concentration of 4 $\mu\text{g}/\text{kg}$ in downstream sediment sample SD1, and 2-butanone at an estimated concentration of 13 $\mu\text{g}/\text{kg}$, 9 $\mu\text{g}/\text{kg}$, and 4 $\mu\text{g}/\text{kg}$ in downstream sediment samples SD1, SD2, and SD2-DP, respectively. Several SVOCs were present in the three downstream samples at concentrations ranging from 33 to 2,800 $\mu\text{g}/\text{kg}$. Several pesticides were detected at estimated concentrations ranging from 1.3 to 57 $\mu\text{g}/\text{kg}$, except for heptachlor epoxide. Heptachlor epoxide was detected at concentrations of 16 $\mu\text{g}/\text{kg}$ and 13 $\mu\text{g}/\text{kg}$ in sediment samples SD2 and SD2-DP,

Table 5-3

**Sediment Sampling Results
Vulcan Material Company
Gary, Indiana**

Parameters	Field Sample Numbers				
	FSIVM-SD01-01 ¹	FSIVM-SD02-01	FSIVM-SD02-01DP	FSIVM-SD03-01	FSIVM-SD04-01 (Background) ²
Volatiles (µg/kg)					
1,2-Dichloroethene	4 J	---	---	---	---
2-Butanone	13 J	9 J	4 J	---	---
Toluene	---	---	---	8 J	---
Xylene (total)	---	---	---	---	15 J
Semivolatiles (µg/kg)					
Naphthalene	620 J	180 J	130 J	1,100 J	970 J
4-Chloro-3-methylphenol	---	---	110 J	---	---
2-Methylnaphthalene	500 J	100 J	76 J	870 J	5,100
2-Methylphenol	---	---	---	58 J	---
4-Methylphenol	---	---	---	170 J	---
2,4-Dimethylphenol	---	---	---	130 J	---
Acenaphthylene	190 J	100 J	120 J	190 J	690 J
Acenaphthene	1,300 J	740	830	4,300 J	53,000 D
Dibenzofuran	1,100 J	270 J	210 J	2,000	35,000 D
Fluorene	900 J	300 J	310 J	2,100	41,000 D
N-nitrosodiphenylamine (1)	190 J	140 J	---	490 J	---
Phenanthrene	1,500 J	490	390 J	2,200 J	36,000 D
Anthracene	490 J	250 J	220 J	1,200 J	10,000
Carbazole	---	33 J	36 J	250 J	---
Fluoranthene	2,800	1,800	1,700	6,300	16,000
Pyrene	10,000 J	1,700	2,000	12,000 D	22,000

CH01\PUBLIC\WO\ARCS\040\18311T5-3

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 5-3
Sediment Sampling Results
Vulcan Material Company
Gary, Indiana
(Continued)

Parameters	Field Sample Numbers				
	FSIVM-SD01-01 ¹	FSIVM-SD02-01	FSIVM-SD02-01DP	FSIVM-SD03-01	FSIVM-SD04-01 (Background) ¹
Semivolatiles (μg/kg) (continued)					
Benzo(a)anthracene	2,900 J	750	1,100	4,800 J	12,000 EJ
Chrysene	3,800 J	930	1,800	5,600 J	13,000 J
bis(2-ethylhexyl)phthalate	5,700 J	490 B	540 B	3,300 J	---
Di-n-octylphthalate	230 J	54 J	72 J	710 J	---
Benzo(b)fluoranthene	5,200 J	720	1,100	4,100 J	8,600 J
Benzo(k)fluoranthene	2,900 J	790	650	5,200 J	13,000 J
Benzo(a)pyrene	4,000 J	740	1,000	5,200 J	11,000 J
Indeno(1,2,3-cd)pyrene	4,500 J	550	780	3,500 J	6,400 J
Dibenzo(a,h)anthracene	2,300 J	230 J	300 J	1,000 J	1,700
Benzo(g,h,i)perylene	5,400 J	570	810	3,800 J	6,500 J
Pesticides/PCBs (μg/kg)					
Heptachlor epoxide	62 JP	16	13	65 JP	130 J
4,4'-DDE	---	11 J	9.1 J	---	79 J
Endrin	---	---	---	---	10 JP
4,4'-DDD	23 JP	1.3 JP	1.7 JP	6.2 J	---
Methoxychlor	38 JP	---	---	18 JP	---
Endrin ketone	39 JP	3.5 JP	---	---	62 J
4,4'-DDT	---	---	---	32 JP	---
alpha-chlordane	6.2 JP	---	---	2.1 JP	---
gamma-chlordane	57 JP	---	---	---	12 JP
Aroclor 1248	3,100 JP	870	720	3,100 JP	6,300 J

CH01\PUBLIC\WO\ARCS\040\18311T.5-3

4500-48-ALV1

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 5-3
Sediment Sampling Results
Vulcan Material Company
Gary, Indiana
(Continued)

Parameters	Field Sample Numbers				
	FSIVM-SD01-01 ¹	FSIVM-SD02-01	FSIVM-SD02-01DP	FSIVM-SD03-01	FSIVM-SD04-01 (Background) ¹
Inorganics (mg/kg)					
Aluminum	14,400	2,280	2,230	10,400	6,070
Antimony	15.6 B	---	---	1.5 B	---
Arsenic	39.5	1.9 B	4.1	13.7	40.7
Barium	280	24.5 B	27.7 B	203	59.3 B
Beryllium	1.7 B	0.35 B	---	1.2 B	1.1 B
Cadmium	7.4	---	0.36 B	2.3	5.8
Calcium	21,000*	16,500*	18,100*	44,100*	14,300*
Chromium	916 JN*	19.8 JN*	45.1 JN*	353 JN*	1,060 JN*
Cobalt	11.1 B	2.6 B	3.5 B	8.4 B	13.5 B
Copper	454 JN	12.4 JN	26.3 JN	223 JN	229 JN
Iron	120,000	10,900 J	22,400 J	102,000 J	196,000 J
Lead	1,430 JN	41.0 JN	86.7 JN	408 JN	857 JN
Magnesium	8,200	6,390	7,150	12,100	3,520 J
Manganese	1,410 J*	210 J*	305 J*	3,610 J*	1,720*
Mercury	0.75 JN*	---	---	0.30 JN*	0.24 JN*
Nickel	98.6	6.7 B	11.5 B	49.4	119
Potassium	883 B	298 B	304 B	942 B	496 B
Selenium	4.2*	---	---	2.8*	5.1*
Silver	7.9	---	0.54 JB	1.8B	2.8 B
Sodium	861 B	185 B	244 B	553 B	498 B

CH01\PUBLIC\WO\ARCS\040\18311T.5-3

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Table 5-3
Sediment Sampling Results
Vulcan Material Company
Gary, Indiana
(Continued)

Parameters	Field Sample Numbers				
	FSIVM-SD01-01 ¹	FSIVM-SD02-01	FSIVM-SD02-01DP	FSIVM-SD03-01	FSIVM-SD04-01 (Background) ¹
Inorganics (mg/kg) (continued)					
Thallium	8.6	---	2.2 B	6.3	8.0
Vanadium	48.1*	5.3 B*	8.0 B*	64.9*	29.7*
Zinc	4,400 J	119 J	284 J	1,350 J	1,860 J
Cyanide	6.6 JN*	2.5 JN*	1.8 JN*	1.4 JN*	4.8 JN*

¹ Re-prep values were used for the following VOC compounds: pyrene, benzo(a)anthracene, chrysene, bis(2-ethylhexyl)phthalate, di-n-octylphthalate, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

Organic Qualifiers:

- B - Indicates the analyte is detected in the associated blank as well as the sample.
- J - Indicates the associated value is an estimated value.
- P - Indicates a pesticide/Aroclor target analyte when there is greater than 25% difference of the detected concentrations between the two GC columns. The lower of the two results is reported.
- E - Indicates compounds whose concentrations exceed the calibration range of the instrument.
- D - Indicates the compound has been diluted.

Inorganic Qualifiers:

- J - Indicates the associated value is an estimated value
- N - Indicates the spike recovery is not within control limits.
- * - Indicates the duplicate analysis is not within control limits.
- B - The associated value is <CRDL to ≥IDL.

CH01\PUBLIC\WO\ARCS\040\18311TS-3

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

respectively. Only Aroclor-1248 was detected in all downstream sediment samples at concentrations ranging from 720 $\mu\text{g/kg}$ to 3100 $\mu\text{g/kg}$.

A key analytical findings table for sediment sampling is presented in Table 5-4. Antimony, barium, and mercury in sediment sample SD1 were detected at concentrations greater than three times the concentration in upstream sediment sample SD4. Barium, calcium, and magnesium were detected in sediment sample SD3 at concentrations greater than three times the concentration in upstream sediment sample SD-4. Gamma-chlordane was detected at concentrations greater than three times the concentration in the upstream sediment sample SD4.

5.6 SUMMARY

Based on the sediment sampling analytical results, gamma-chlordane, antimony, barium, and mercury were present in the downstream sediment samples at concentrations greater than three times the potential upstream sediment sample. Bis(2-ethylhexyl)phthalate was detected above the CRDL/SQL in the downgradient samples and was not detected in the upgradient sample. Only mercury, which was present in the downstream sediment samples above the CRDL/SQL, was not detected in the background soil sample. The sediment sampling analytical results clearly indicate that the Grand Calumet River has been significantly impacted by other upstream sources, including the GLD landfill site. Downstream sediment sampling indicates that the Vulcan Materials site may have contributed to the contamination of sediments in the Grand Calumet. Because of the level of contaminants detected in the upgradient location, however, the extent of the contribution of the Vulcan Materials site to sediment contamination downstream from the site is difficult to assess.

Table 5-4

**Key Analytical Findings of Sediment Sampling
Vulcan Materials Company
Gary, Indiana**

Sample I.D.	Depth (feet)	Location	Units	Compound	Concentration	Background Concentration SD04-01
FSIVM-SD01-01	0 - 0.5	Wetlands along the bank of the Grand Calumet River	µg/kg	bis(2-ethylhexyl)phthalate	5,700 J	<2,600
				gamma-chlordane	57 JP	12 J
			mg/kg	Antimony	15.6 B	1.3
				Barium	280	59.3 B
				Mercury	0.75 JN*	0.24 JN*
FSIVM-SD03-01	0 - 0.5	Along the Grand Calumet River, 75 feet upgradient from the PPE, between the site and the Gary Land Development Site	µg/kg	bis(2-ethylhexyl)phthalate	3,300 J	<2,600
				4-4'-DDT	32 JP	<26
			mg/kg	Barium	203	59.3
				Calcium	44,100	14,300
				Magnesium	12,100	3,520 J

¹ Re-prep values were used for the following VOC compounds: pyrene, benzo(a)anthracene, chrysene, bis(2-ethylhexyl)phthalate, di-n-octylphthalate, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

Organic Qualifiers:

J - Indicates the associated value is an estimated value.

P - Indicates a pesticide/Aroclor target analyte when there is greater than 25% difference of the detected concentrations between the two GC columns. The lower of the two results is reported.

< - Less than CRDL/SQL.

Inorganic Qualifiers:

J - Indicates the associated value is an estimated value

N - Indicates the spike recovery is not within control limits.

* - Indicates the duplicate analysis is not within control limits.

B - The associated value is <CRDL to ≥IDL.

< - Less than CRDL/SQL.

CH01\PUBLIC\WO\ARCS\040\18311T5-4

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

SECTION 6

SOIL AND AIR EXPOSURE PATHWAYS

This section discusses the physical conditions of the site and the potential soil and air targets near the site.

6.1 PHYSICAL CONDITIONS

The site is fenced on three sides and the terrain limits site access on the unfenced side. There is a breach in the fence; however, 24-hour security is present at the main gate.

6.2 TARGETS

There are approximately 130,892 people living within a 4-mile radius of the site, as shown in Table 6-1, (Reference 4, 5, 6, 7, 8, 20). There are no residences located at the site; however, 40 workers are present during working hours. The 4-mile radius map indicates the majority of the area is industrial and residential.

6.3 SOIL ANALYTICAL RESULTS

No surface soils samples were collected during this FSIP.

6.4 AIR ANALYTICAL RESULTS

No formal air monitoring was conducted during the FSIP. Qualitative air monitoring was conducted during the FSIP for health and safety purposes using field instruments. No measurements above background were detected at any sampling location.

Table 6-1

**Population within 4 Miles
Vulcan Materials Company
Gary, Indiana**

Distance (miles)	Population
0 to ¼	1,728
¼ to ½	2,110
½ to 1	8,222
1 to 2	26,232
2 to 3	39,996
3 to 4	52,564
Total	130,892

6.5 SUMMARY

The site is fenced on three sides, the terrain limits site access on the unfenced side, and 24-hour security is present at the site. Therefore, the site is inaccessible to the general public, but there are 40 workers present on site. Even though contaminants were detected in the subsurface soil samples, there is no indication of a release to the air pathway by the facility at this time.

SECTION 7

SUMMARY

The Vulcan Materials FSIP gathered the data necessary to evaluate the site as a candidate for the NPL. Environmental samples were collected to analyze and investigate potential migration pathways. Information was also collected to confirm target populations and environmental media potentially at risk due to site operations.

The Vulcan Materials Company site is an active scrap steel detinning facility. The detinning process involves stripping of tin from the tin-plated scrap steel by immersing the steel in a heated 5 to 6 percent caustic solution with sodium nitrate as an oxidizing agent. The site has a lined storage pond, an unlined storage pond, a former land-spreading area for detinning mud, and detinning mud storage pads.

There is no population that relies on groundwater within a 4-mile radius of the site. All people within a 4-mile radius of the site obtain water from municipal waters system with intakes in Lake Michigan.

The on-site soil samples are significantly impacted with SVOCs and heavy metals. Low levels of VOCs, pesticides, and metals are also present in the on-site soil. The presence of contamination detected in the on-site soil samples could not have resulted from the detinning operations. However, there is no information in the site history that indicates that wastes other than detinning mud were disposed at the site. Hence, the subsurface soil contamination cannot at this time be attributed to the known history of operations at the site.

The sediment sampling results show that the Grand Calumet River has been significantly impacted by sources upstream from the Vulcan Materials site. Only mercury was detected in the on-site soil samples and in the sediment sample downgradient of the site. While downstream sediment sampling indicates that the site may have contributed to

CH01\PUBLIC\WO\ARCS\040\18311.S-7

7-1

4500-48-ALVI

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

contamination in the Grand Calumet River, the extent of the contribution of the site to sediment contamination downstream of the site is difficult to assess because the upstream sediments have significantly high levels of contamination.

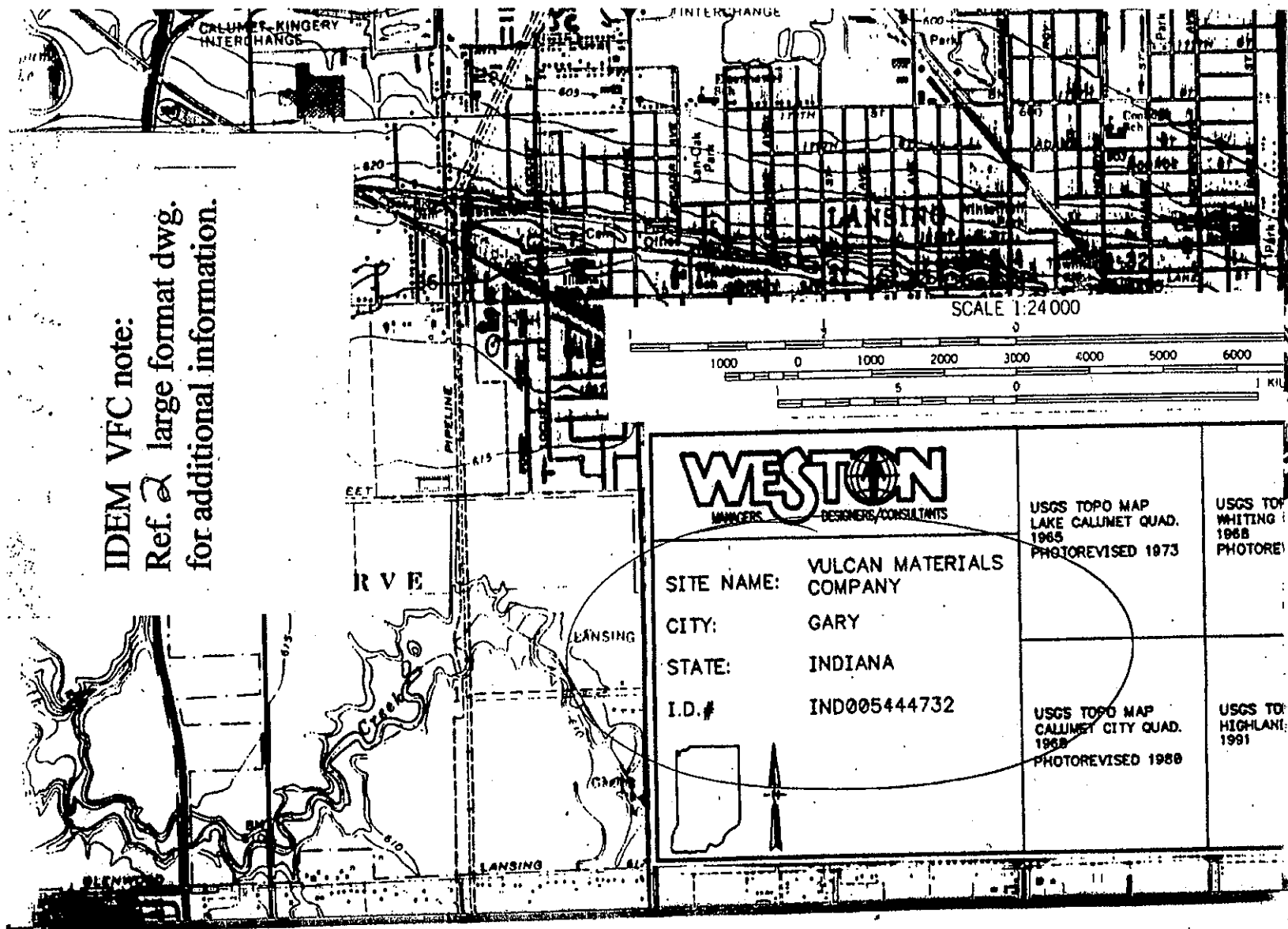
SECTION 8

REFERENCES

1. Daily, Don. *Preliminary Assessment of the Vulcan Materials Company Site*. Indiana State Board of Health. 2 March 1994.
2. Ecology & Environment Inc. *Potential Hazardous Waste Site Inspection Report*. 16 May 1984.
3. Pels, Jan. Approval of Site Specific Implementation Plan, 19 April 1995.
4. U.S. Geological Survey. 1965. Lake Calumet, IL. 7.5-Minute Series Topographic Map. Photorevised 1973.
5. U.S. Geological Survey. 1968. Calumet City, IL. 7.5-Minute Series Topographic Maps Photorevised 1980.
6. U.S. Geological Survey. 1968. Whiting, IN. 7.5-Minute Series Topographic Map. Photorevised 1980.
7. U.S. Geological Survey. Highland, IN. 7.5-Minute Series Topographic Map. 1991.
8. U.S. Geological Survey. Gary, IN. 7.5-Minute Series Topographic Map. 1991.
9. D'Appolonia Consulting Engineers, Inc. *Preliminary Hydrogeological Investigation and Geochemical Testing*. March 1981.
10. Persinger, Ival D. *Soil Survey of Lake County, Indiana*. U.S. Department of Agriculture, Soil Conservation Service. July 1972.
11. Roy F. Weston, Inc. *Quality Assurance Project Plan for Superfund Site Assessments*. October 1991.
12. Hartke, Edwin J.; Hill, John R.; and Reshkin, Mark. *Environmental Geology of Lake and Porter Counties, Indiana - An Aid to Planning*. Department of Natural Resources. 1975.
13. Williams, Gary. Hammond Water Works Department. Letter to Daniel L. Briller, Roy F. Weston, Inc. 28 June 1994.
14. Knight, Joe. East Chicago Water Department. Letter to Daniel L. Briller, Roy F. Weston, Inc. July 1994.

15. Siambus, Nancy. Amoco Oil Company. Telephone conversation with Daniel L. Briller, Roy F. Weston, Inc. 14 July 1993.
16. U.S. Geological Survey. Jackson Park, IL. 7.5-Minute Series Topographic Map. 1963.
17. U.S. Geological Survey. Blue Island, IL. 7.5-Minute Series Topographic Map. 1993.
18. Olson, Dan. East Chicago Sanitary District. Telephone conversation with Daniel L. Briller, Roy F. Weston, Inc. 8 May 1995.
19. U.S. Bureau of the Census. *Summary Population and Housing Characteristics - Illinois*. 1990.
20. U.S. Bureau of the Census. *Summary Population and Housing Characteristics - Indiana*. 1990.
21. U.S. Department of the Interior. National Wetland Inventory Maps of Lake Calumet, Calumet City, Whiting, Highland, Blue Island, and Gary.
22. Hellmich, Ronald P. Indiana Department of Natural Resources. Letter to Daniel L. Briller, Roy F. Weston, Inc. 3 November 1994.

IDEM VFC note:
Ref. & large format dwg.
for additional information.



WESTON
MANAGERS DESIGNERS/CONSULTANTS

SITE NAME: VULCAN MATERIALS COMPANY
CITY: GARY
STATE: INDIANA
I.D.# IND005444732



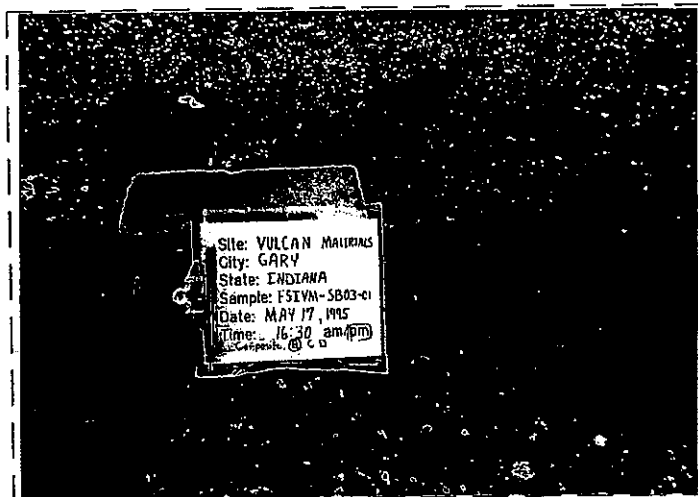
USGS TOPO MAP
LAKE CALLUMET QUAD.
1965
PHOTOREVISED 1973

USGS TO
WHITING
1968
PHOTOREVISED

USGS TOPO MAP
CALLUMET CITY QUAD.
1968
PHOTOREVISED 1988

USGS TO
HIGHLAND
1991

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 16:30
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSI VM - SB03-01B
DESCRIPTION: Sample I.D. logsheet for SB03-01B



SAMPLING PHOTO # 1

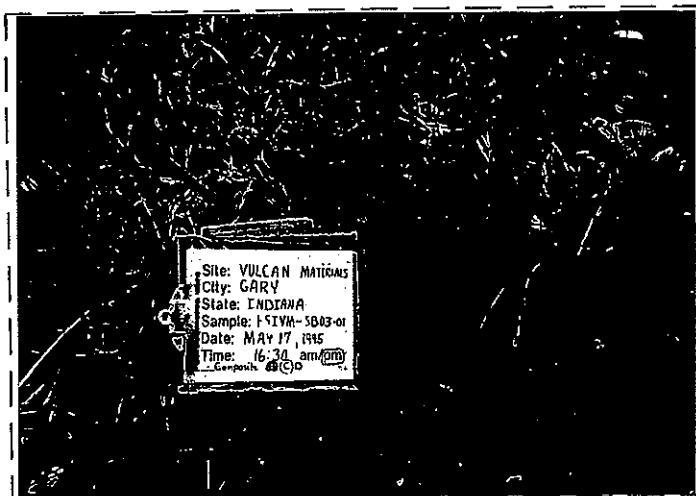
SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: May 1995
TIME: 16:30
DIRECTION OF PHOTOGRAPH: West
WEATHER CONDITIONS: low 60's overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSI VM - SB03-01B
DESCRIPTION: Sample perspective shot for SB03-01B,
west perimeter of former storage pond



SAMPLING PHOTO # 2

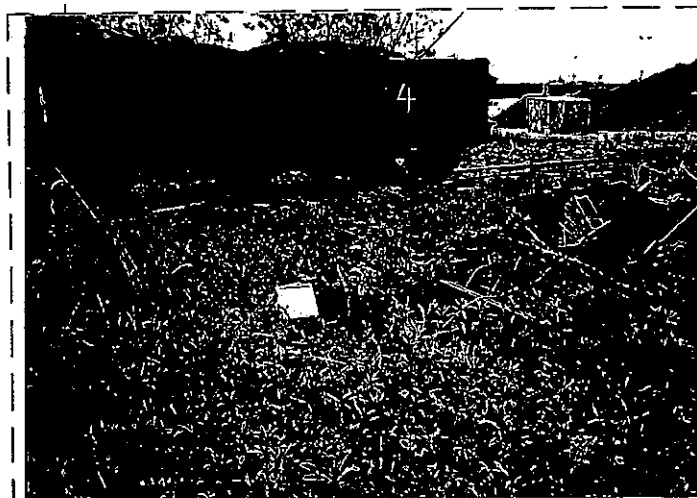
82992

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 16:30
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB03-01C
DESCRIPTION: Sample I.D. logsheet for SB03-01C



SAMPLING PHOTO # 3

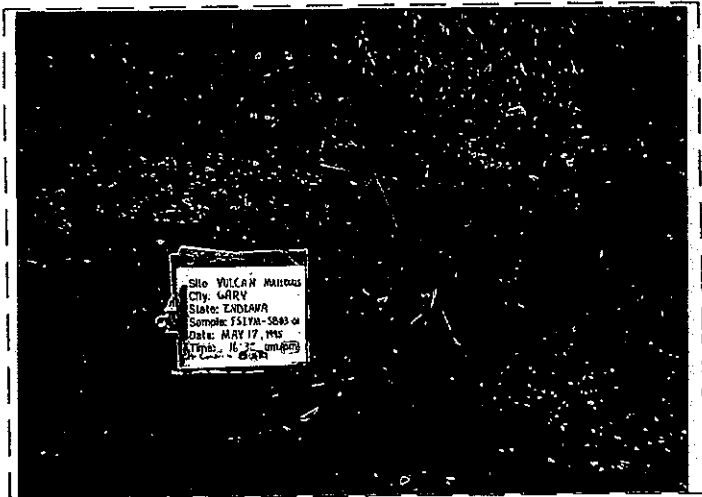
SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 16:30
DIRECTION OF PHOTOGRAPH: West
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB03-01C
DESCRIPTION: Sample perspective photo for SB03-01C,
southwest corner of former storage pond



SAMPLING PHOTO # 4

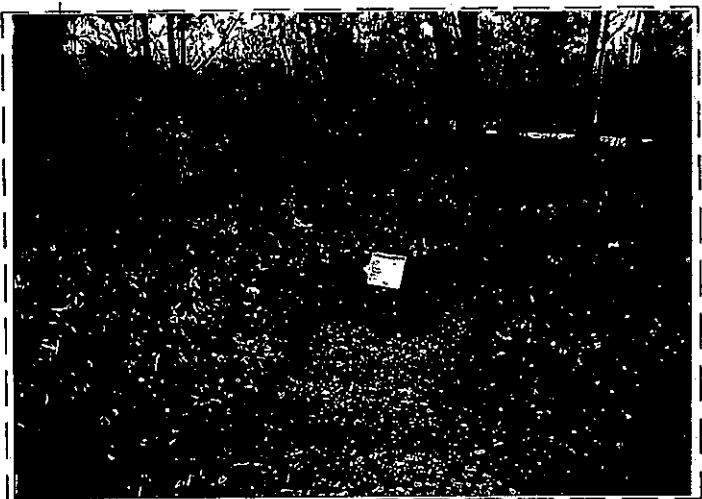
82992

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: May 1995
TIME: 16:30
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SB03-01D
DESCRIPTION: Sample I.D. logsheet for SB03-01D



SAMPLING PHOTO # 5

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: May 1995
TIME: 16:30
DIRECTION OF PHOTOGRAPH: South
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SB03-01D
DESCRIPTION: Sample perspective photo for SB03-01D,
South perimeter of former storage pond.



SAMPLING PHOTO # 6

82992

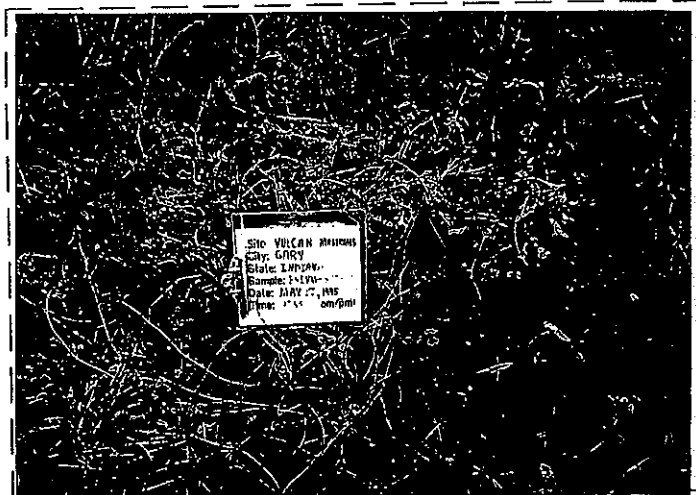
SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 17:05
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SB04-01 + ODP
DESCRIPTION: Sample I.D. logsheet for SB04-01, ODP



SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 17:05
DIRECTION OF PHOTOGRAPH: East
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SB04-01 + ODP
DESCRIPTION: Sample perspective photo for SB04-01, ODP
East perimeter of former storage pond, between the former
storage pond and the lined storage pond.

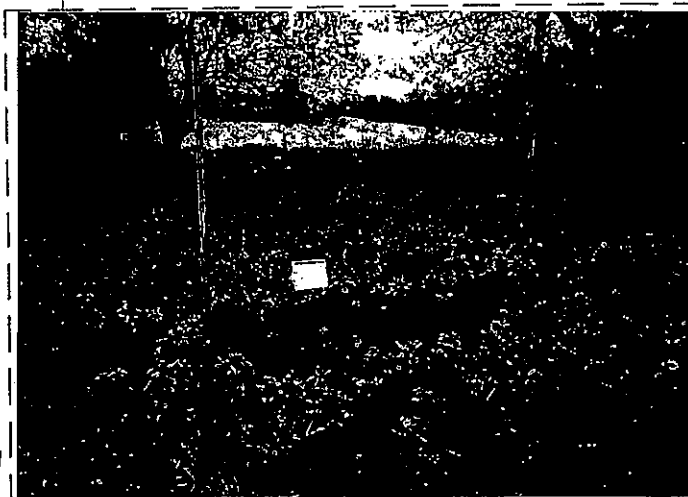


SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 17:45
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM - SB05-01
DESCRIPTION: Sample I.D. logsheet for SB05-01



SAMPLING PHOTO # 9

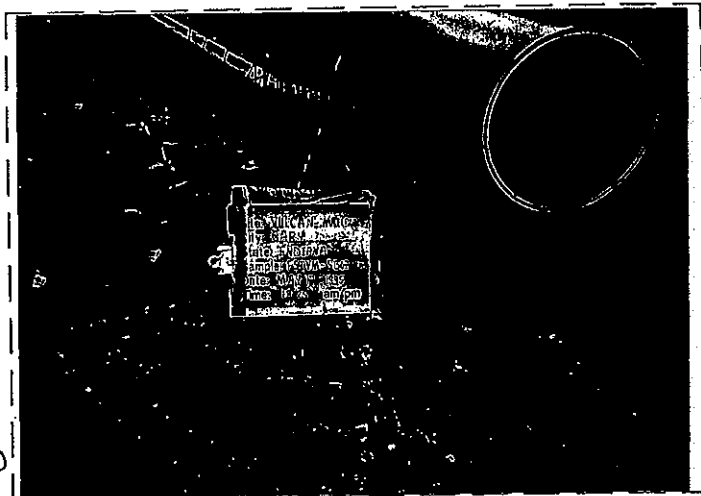
SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 17:45
DIRECTION OF PHOTOGRAPH: North
WEATHER CONDITIONS: low 60's, overcast
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM - SB05-01
DESCRIPTION: Sample perspective photo for SB05-01,
South perimeter of lined storage pond



SAMPLING PHOTO # 10

62992

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 18:25
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: low 60's, overcast, rain
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB02-01MSD
DESCRIPTION: Sample I.D. logsheet for SB02-01MSD



SAMPLING PHOTO # 11

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 17 May 1995
TIME: 18:25
DIRECTION OF PHOTOGRAPH: West
WEATHER CONDITIONS: low 60's, overcast, rain
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB02-01MSD
DESCRIPTION: Sample perspective photo for SB02-01MSD
Western boundary of site, southwest section of detinning
mud landsread area



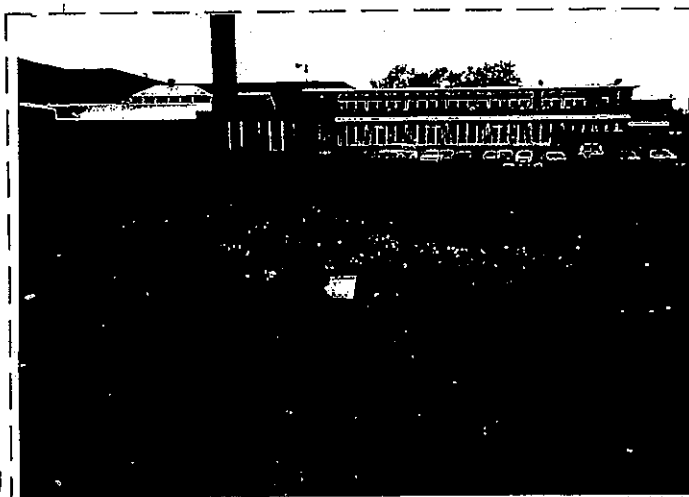
SAMPLING PHOTO # 12

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 10:45
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: Mid 50's, light rain
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB06-01
DESCRIPTION: Sample I.D. logsheet for SB06-01



SAMPLING PHOTO # 13

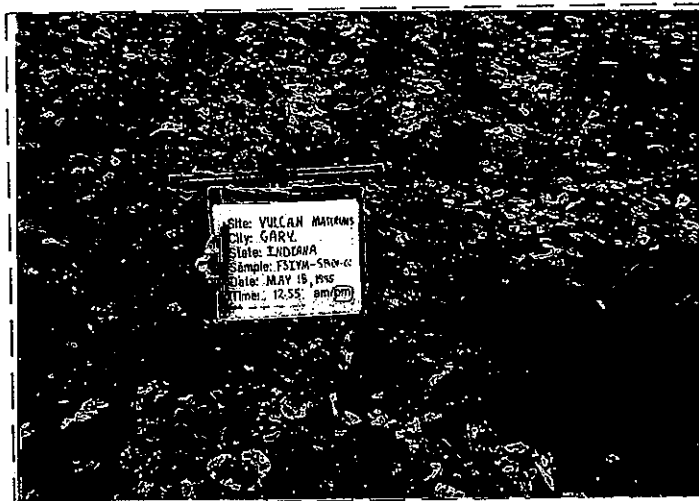
SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 10:45
DIRECTION OF PHOTOGRAPH: South
WEATHER CONDITIONS: Mid 50's, light rain
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB06-01
DESCRIPTION: Sample perspective photo for SB06-01,
background soil location at Edison School in Gary, IN



SAMPLING PHOTO # 14

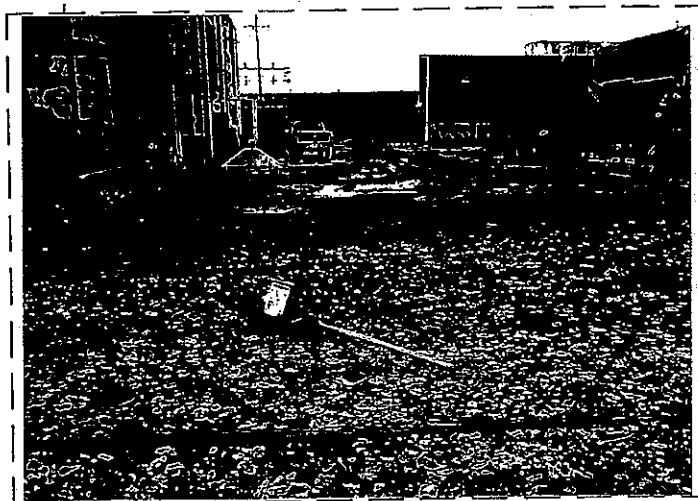
62002

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 12:55
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: Overcast, Mid 50's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB01-01
DESCRIPTION: Sample I.D. logsheet for SB01-01



SAMPLING PHOTO # 15

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 12:55
DIRECTION OF PHOTOGRAPH: West
WEATHER CONDITIONS: Overcast, Mid 50's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SB01-01
DESCRIPTION: Sample perspective photo for SB01-01,
northeast section of detinning mud landspread area



SAMPLING PHOTO # 16

62992

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 14:15
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SD02-01 + 01DP
DESCRIPTION: Sample I.D. logsheet for SD02-01, 01DP



SAMPLING PHOTO # 17

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 14:15
DIRECTION OF PHOTOGRAPH: South
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SD02-01 + 01DP
DESCRIPTION: Sample perspective photo for SD02-01, 01DP
Downstream sediment sample in Grand Calumet River (Duplicate

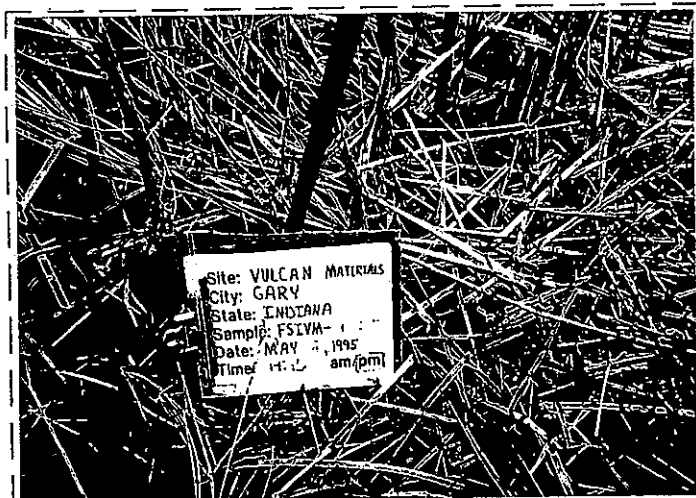


SAMPLING PHOTO # 18

62992

Sediment
1 or 2...

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 14:45
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SD01-01
DESCRIPTION: Sample I.D. logsheet for SD01-01



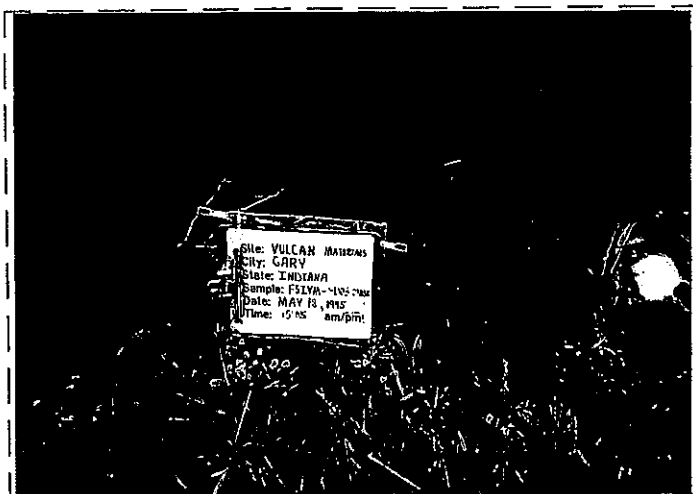
SAMPLING PHOTO # 19

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 14:45
DIRECTION OF PHOTOGRAPH: South
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SD01-01
DESCRIPTION: Sample perspective photo for SD01-01
Sediment sample from wetlands along north bank of
Grand Calumet River, near east boundary of site. (East PPE)



SAMPLING PHOTO # 20

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 15:05
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SD03-01MSD
DESCRIPTION: Sample I.D. logsheet for SD03-01MSD



SAMPLING PHOTO # 21

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 15:05
DIRECTION OF PHOTOGRAPH: West
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIVM-SD03-01MSD
DESCRIPTION: Sample perspective photo for SD03-01MSD,
Sediment sample from Grand Calumet River, upstream of PPE at
02002 property boundary between Vulcan Materials & GLD Landfill.



SAMPLING PHOTO # 22

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 15:45
DIRECTION OF PHOTOGRAPH: NA
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SD04-01
DESCRIPTION: Sample I.D. logsheet for SD04-01



SAMPLING PHOTO # 23

SITE NAME: Vulcan Materials Company
U.S. EPA ID: IND 005444732
DATE: 18 May 1995
TIME: 15:45
DIRECTION OF PHOTOGRAPH: South
WEATHER CONDITIONS: Overcast, low 60's
PHOTOGRAPHED BY: G. Douglas Ogilvie
SAMPLE ID (if applicable): FSIUM-SD04-01
DESCRIPTION: Sample perspective photo for SD04-01
background sediment sample ≈ 0.4 miles upstream of PPE
collected from Grand Calumet River



SAMPLING PHOTO # 24

SITE NAME: Vulcan Materials Company

U.S. EPA ID: IND 005444732

DATE: 17 May 1995

TIME: 14:30

DIRECTION OF PHOTOGRAPH: East

WEATHER CONDITIONS: Overcast, Mid 50's

PHOTOGRAPHED BY: G. Douglas Ogilvie

SAMPLE ID (if applicable): NA

DESCRIPTION: Proposed sampling location SB04-01A,
east perimeter of former unlined pond, unable to collect soil sample
due to auger refusal.

SITE NAME: Vulcan Materials Company

U.S. EPA ID: IND 005444732

DATE: 17 May 1995

TIME: 14:30

DIRECTION OF PHOTOGRAPH: North

WEATHER CONDITIONS: Overcast, Mid 50's

PHOTOGRAPHED BY: G. Douglas Ogilvie

SAMPLE ID (if applicable): NA

DESCRIPTION: Proposed sampling location SB03-01A,
north perimeter of former unlined pond, unable to collect soil
sample due to auger refusal.



SAMPLING PHOTO # 25



SAMPLING PHOTO # 26

SITE NAME: Vulcan Materials Company

U.S. EPA ID: IND 005444732

DATE: 17 May 1995

TIME: 14:45

DIRECTION OF PHOTOGRAPH: South

WEATHER CONDITIONS: Overcast, mid 50's

PHOTOGRAPHED BY: G. Douglas Ogilvie

SAMPLE ID (if applicable): NA

DESCRIPTION: Liner / berm surrounding the lined storage pond; the liner, man-made berm, and nearby wetlands prevented collection of proposed samples

SITE NAME: Vulcan Materials Company SBOS-DIA, OIC

U.S. EPA ID: IND 005444732

DATE: 17 May 1995

TIME: 14:45

DIRECTION OF PHOTOGRAPH: Northeast

WEATHER CONDITIONS: Overcast, mid 50's

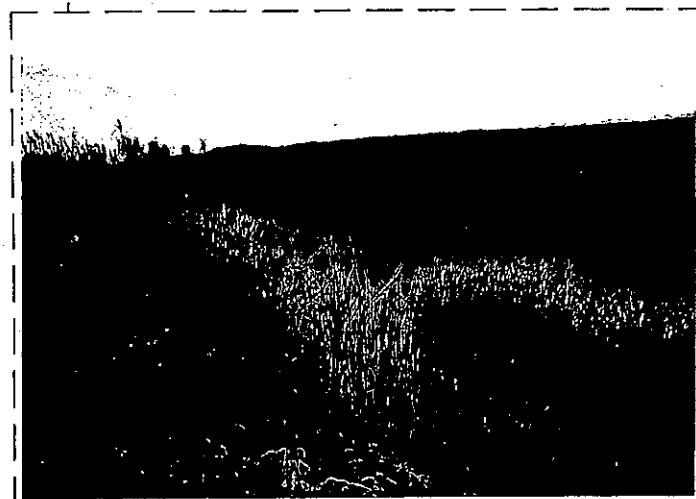
PHOTOGRAPHED BY: G. Douglas Ogilvie

SAMPLE ID (if applicable): NA

DESCRIPTION: Wetlands area located immediately east and north of the lined storage pond; west slope of GLD landfill in background.



SAMPLING PHOTO # 27



SAMPLING PHOTO # 28

SITE NAME: Vulcan Materials Company

U.S. EPA ID: IND 005444732

DATE: 17 May 1995

TIME: 15:00

DIRECTION OF PHOTOGRAPH: West

WEATHER CONDITIONS: Overcast, Mid 50's

PHOTOGRAPHED BY: G. Douglas Ogilvie

SAMPLE ID (if applicable): NA

DESCRIPTION: Proposed sampling location SB02-01B, north
perimeter of former detinning mud landspread area, unable to collect soil sample due to concrete in entire area.

SITE NAME: Vulcan Materials Company

U.S. EPA ID: IND 005444732

DATE: 17 May 1995

TIME: 15:00

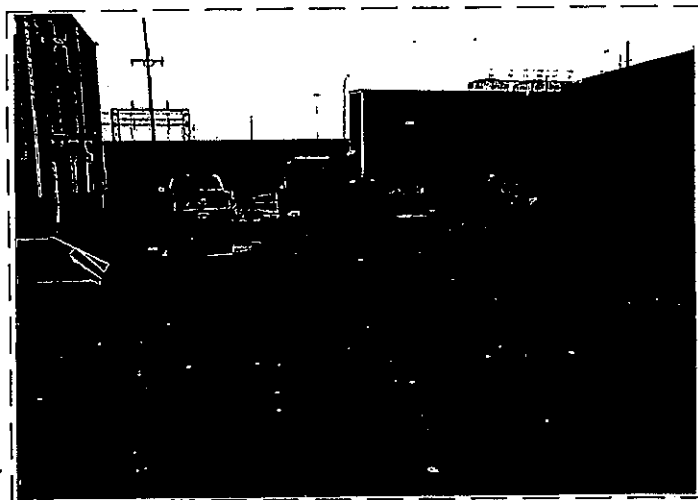
DIRECTION OF PHOTOGRAPH: East

WEATHER CONDITIONS: Overcast, Mid 50's

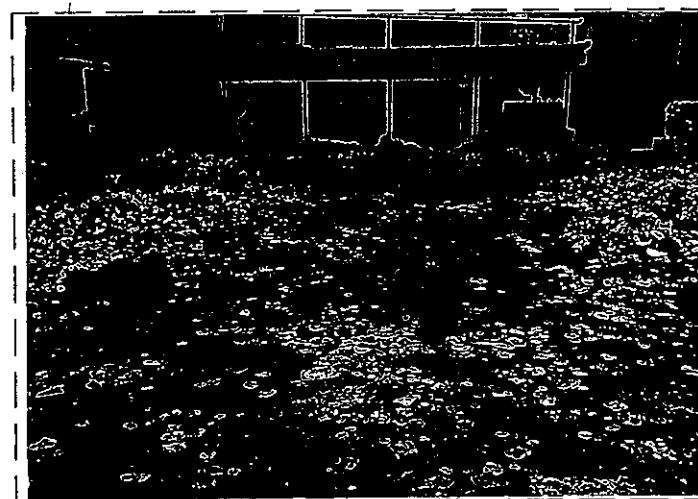
PHOTOGRAPHED BY: G. Douglas Ogilvie

SAMPLE ID (if applicable): NA

DESCRIPTION: Proposed sampling location SB01-01A,
south perimeter of former detinning mud landspread area, unable to
collect soil sample due to concrete in entire area.



SAMPLING PHOTO # 29



SAMPLING PHOTO # 30

1.0 VOLATILES TARGET COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS

Volatiles	CAS Number	Quantitation Limits			
		Water ug/L	Lcw Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
1. Chloromethane	74-87-3	10	10	1200	(50)
2. Bromomethane	74-83-9	10	10	1200	(50)
3. Vinyl Chloride	75-01-4	10	10	1200	(50)
4. Chloroethane	75-00-3	10	10	1200	(50)
5. Methylene Chloride	75-09-2	10	10	1200	(50)
6. Acetone	67-64-1	10	10	1200	(50)
7. Carbon Disulfide	75-15-0	10	10	1200	(50)
8. 1,1-Dichloroethene	75-35-4	10	10	1200	(50)
9. 1,1-Dichloroethane	75-34-3	10	10	1200	(50)
10. 1,2-Dichloroethene (total)	540-59-0	10	10	1200	(50)
11. Chloroform	67-66-3	10	10	1200	(50)
12. 1,2-Dichloroethane	107-06-2	10	10	1200	(50)
13. 2-Butanone	78-93-3	10	10	1200	(50)
14. 1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
15. Carbon Tetrachloride	56-23-5	10	10	1200	(50)
16. Bromodichloromethane	75-27-4	10	10	1200	(50)
17. 1,2-Dichloropropane	78-87-5	10	10	1200	(50)
18. cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
19. Trichloroethene	79-01-6	10	10	1200	(50)
20. Dibromochloromethane	124-48-1	10	10	1200	(50)
21. 1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
22. Benzene	71-43-2	10	10	1200	(50)
23. trans-1,3- Dichloropropene	10061-02-6	10	10	1200	(50)
24. Bromoform	75-25-2	10	10	1200	(50)
25. 4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
26. 2-Hexanone	591-78-6	10	10	1200	(50)
27. Tetrachloroethene	127-18-4	10	10	1200	(50)
28. 1,1,2,2- Tetrachloroethane	79-34-5	10	10	1200	(50)
29. Toluene	108-88-3	10	10	1200	(50)
30. Chlorobenzene	108-90-7	10	10	1200	(50)
31. Ethylbenzene	100-41-4	10	10	1200	(50)
32. Styrene	100-42-5	10	10	1200	(50)
33. Xylenes (total)	1330-20-7	10	10	1200	(50)

Exhibit C -- Section 2
Semivolatiles (SVOA)

2.0 SEMIVOLATILES TARGET COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS

Semivolatiles	CAS Number	Quantitation Limits			
		Water	Low Soil	Med. Soil	On Column
		ug/L	ug/Kg	ug/Kg	(ng)
34. Phenol	108-95-2	10	330	10000	(20)
35. bis-(2-Chloroethyl) ether	111-44-4	10	330	10000	(20)
36. 2-Chlorophenol	95-57-8	10	330	10000	(20)
37. 1,3-Dichlorobenzene	541-73-1	10	330	10000	(20)
38. 1,4-Dichlorobenzene	106-46-7	10	330	10000	(20)
39. 1,2-Dichlorobenzene	95-50-1	10	330	10000	(20)
40. 2-Methylphenol	95-48-7	10	330	10000	(20)
41. 2,2'-oxybis (1-Chloropropane) ¹	108-60-1	10	330	10000	(20)
42. 4-Methylphenol	106-44-5	10	330	10000	(20)
43. N-Nitroso-di-n-propylamine	621-64-7	10	330	10000	(20)
44. Hexachloroethane	67-72-1	10	330	10000	(20)
45. Nitrobenzene	98-95-3	10	330	10000	(20)
46. Isophorone	78-59-1	10	330	10000	(20)
47. 2-Nitrophenol	88-75-5	10	330	10000	(20)
48. 2,4-Dimethylphenol	105-67-9	10	330	10000	(20)
49. bis(2-Chloroethoxy) methane	111-91-1	10	330	10000	(20)
50. 2,4-Dichlorophenol	120-83-2	10	330	10000	(20)
51. 1,2,4-Trichlorobenzene	120-82-1	10	330	10000	(20)
52. Naphthalene	91-20-3	10	330	10000	(20)
53. 4-Chloroaniline	106-47-8	10	330	10000	(20)
54. Hexachlorobutadiene	87-68-3	10	330	10000	(20)
55. 4-Chloro-3-methylphenol	59-50-7	10	330	10000	(20)
56. 2-Methylnaphthalene	91-57-6	10	330	10000	(20)
57. Hexachlorocyclopentadiene	77-47-4	10	330	10000	(20)
58. 2,4,6-Trichlorophenol	88-06-2	10	330	10000	(20)
59. 2,4,5-Trichlorophenol	95-95-4	25	830	25000	(50)
60. 2-Chloronaphthalene	91-58-7	10	330	10000	(20)
61. 2-Nitroaniline	88-74-4	25	830	25000	(50)

¹Previously known by the name bis(2-Chloroisopropyl) ether.

Exhibit C -- Section 2
Semivolatiles (SVOA)

Semivolatiles	CAS Number	Quantitation Limits			
		Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
62. Dimethylphthalate	131-11-3	10	330	10000	(20)
63. Acenaphthylene	208-96-8	10	330	10000	(20)
64. 2,6-Dinitrotoluene	606-20-2	10	330	10000	(20)
65. 3-Nitroaniline	99-09-2	25	830	25000	(50)
66. Acenaphthene	83-32-9	10	330	10000	(20)
67. 2,4-Dinitrophenol	51-28-5	25	830	25000	(50)
68. 4-Nitrophenol	100-02-7	25	830	25000	(50)
69. Dibenzofuran	132-64-9	10	330	10000	(20)
70. 2,4-Dinitrotoluene	121-14-2	10	330	10000	(20)
71. Diethylphthalate	84-66-2	10	330	10000	(20)
72. 4-Chlorophenyl- phenyl ether	7005-72-3	10	330	10000	(20)
73. Fluorene	86-73-7	10	330	10000	(20)
74. 4-Nitroaniline	100-01-6	25	830	25000	(50)
75. 4,6-Dinitro-2- methylphenol	534-52-1	25	830	25000	(50)
76. N-Nitroso- diphenylamine	86-30-6	10	330	10000	(20)
77. 4-Bromophenyl- phenylether	101-55-3	10	330	10000	(20)
78. Hexachlorobenzene	118-74-1	10	330	10000	(20)
79. Pentachlorophenol	87-86-5	25	830	25000	(50)
80. Phenanthrene	85-01-8	10	330	10000	(20)
81. Anthracene	120-12-7	10	330	10000	(20)
82. Carbazole	86-74-8	10	330	10000	(20)
83. Di-n-butylphthalate	84-74-2	10	330	10000	(20)
84. Fluoranthene	206-44-0	10	330	10000	(20)
85. Pyrene	129-00-0	10	330	10000	(20)
86. Butylbenzylphthalate	85-68-7	10	330	10000	(20)
87. 3,3'- Dichlorobenzidine	91-94-1	10	330	10000	(20)
88. Benzo(a)anthracene	56-55-3	10	330	10000	(20)
89. Chrysene	218-01-9	10	330	10000	(20)
90. bis(2-Ethylhexyl) phthalate	117-81-7	10	330	10000	(20)
91. Di-n-octylphthalate	117-84-0	10	330	10000	(20)
92. Benzo(b)fluoranthene	205-99-2	10	330	10000	(20)
93. Benzo(k)fluoranthene	207-08-9	10	330	10000	(20)

C-5

OLM03.0

Exhibit C -- Section 2
Semivolatiles (SVOA)

Semivolatiles	CAS Number	Quantitation Limits			
		Water	Low Soil	Med. Soil	On Column
		ug/L	ug/Kg	ug/Kg	(ng)
94. Benzo(a)pyrene	50-32-8	10	330	10000	(20)
95. Indeno(1,2,3-cd)-pyrene	193-39-5	10	330	10000	(20)
96. Dibenzo(a,h)-anthracene	53-70-3	10	330	10000	(20)
97. Benzo(g,h,i)perylene	191-24-2	10	330	10000	(20)

C-6

OLM03.0

3.0 PESTICIDES/AROCLORS TARGET COMPOUND LIST AND CONTRACT REQUIRED
QUANTITATION LIMITS^{2,3}

Pesticides/Aroclors	CAS Number	Quantitation Limits		
		Water	Soil	On Column
		ug/L	ug/Kg	(pg)
98. alpha-BHC	319-84-6	0.050	1.7	5
99. beta-BHC	319-85-7	0.050	1.7	5
100. delta-BHC	319-86-8	0.050	1.7	5
101. gamma-BHC (Lindane)	58-89-9	0.050	1.7	5
102. Heptachlor	76-44-8	0.050	1.7	5
103. Aldrin	309-00-2	0.050	1.7	5
104. Heptachlor epoxide ⁴	111024-57-3	0.050	1.7	5
105. Endosulfan I	959-98-8	0.050	1.7	5
106. Dieldrin	60-57-1	0.10	3.3	10
107. 4,4'-DDE	72-55-9	0.10	3.3	10
108. Endrin	72-20-8	0.10	3.3	10
109. Endosulfan II	33213-65-9	0.10	3.3	10
110. 4,4'-DDD	72-54-8	0.10	3.3	10
111. Endosulfan sulfate	1031-07-8	0.10	3.3	10
112. 4,4'-DDT	50-29-3	0.10	3.3	10
113. Methoxychlor	72-43-5	0.50	17	50
114. Endrin ketone	53494-70-5	0.10	3.3	10
115. Endrin aldehyde	7421-93-4	0.10	3.3	10
116. alpha-Chlordane	5103-71-9	0.050	1.7	5
117. gamma-Chlordane	5103-74-2	0.050	1.7	5
118. Toxaphene	8001-35-2	5.0	170	500
119. Aroclor-1016	12674-11-2	1.0	33	100
120. Aroclor-1221	11104-28-2	2.0	67	200
121. Aroclor-1232	11141-16-5	1.0	33	100
122. Aroclor-1242	53469-21-9	1.0	33	100
123. Aroclor-1248	12672-29-6	1.0	33	100
124. Aroclor-1254	11097-69-1	1.0	33	100
125. Aroclor-1260	11096-82-5	1.0	33	100

²There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of pesticides/Aroclors.

³The lower reporting limit for pesticide instrument blanks shall be one-half the CRQL values for water samples.

⁴Only the exo-epoxy isomer (isomer B) of heptachlor epoxide is reported on the data reporting forms (Exhibit B).

C-7

OLM03.0

RAS

INORGANIC TARGET ANALYTE LIST (TAL)

Analyte	Contract Required Detection Limit (1,2) (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

- (1) Subject to the restrictions specified in the first page of Part G, Section IV of Exhibit D (Alternate Methods - Catastrophic Failure) any analytical method specified in SOV Exhibit D may be utilized as long as the documented instrument or method detection limits meet the Contract Required Detection Limit (CRDL) requirements. Higher detection limits may only be used in the following circumstance:

If the sample concentration exceeds five times the detection limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the Contract Required Detection Limit. This is illustrated in the example below:

For lead:

- Method in use - ICP
- Instrument Detection Limit (IDL) - 40
- Sample concentration - 220
- Contract Required Detection Limit (CRDL) - 3

TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTIFICATION LIMITS (CROL)

Volatiles	CAS Number	Quantification Limits
		Water ug/L
1. Chloromethane	74-87-3	1
2. Bromomethane	74-83-9	1
3. Vinyl chloride	75-01-4	1
4. Chloroethane	75-00-3	1
5. Methylene chloride	75-09-2	2
6. Acetone	67-64-1	5
7. Carbon disulfide	75-15-0	1
8. 1,1-Dichloroethane	75-35-4	1
9. 1,1-Dichloroethane	75-34-3	1
10. cis-1,2-Dichloroethane	156-59-4	1
11. trans-1,2-Dichloroethane	156-60-3	1
12. Chloroform	67-66-3	1
13. 1,2-Dichloroethane	107-06-2	1
14. 2-Butanone	78-93-3	5
15. Bromochloromethane	74-97-3	1
16. 1,1,1-Trichloroethane	71-55-6	1
17. Carbon Tetrachloride	56-23-5	1
18. Bromodichloromethane	75-27-4	1
19. 1,2-Dichloropropane	78-87-3	1
20. cis-1,3-Dichloropropene	10061-01-5	1
21. Trichloroethane	79-01-6	1
22. Dibromochloromethane	124-48-1	1
23. 1,1,2-Trichloroethane	79-00-5	1
24. Benzene	71-43-2	1
25. trans-1,3-Dichloropropene	10061-02-6	1
26. Bromoform	75-25-2	1
27. 4-Methyl-2-pentanone	108-10-1	5
28. 2-Hexanone	591-78-6	5
29. Tetrachloroethane	127-18-4	1

TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
(CONT'D.)

Volatiles	CAS Number	Quantitation Limits
		Varcat ug/L
30. 1,1,2,2-Tetrachloroethane	79-34-5	1
31. 1,2-Dibromoethane	106-93-4	1
32. Toluene	108-88-3	1
33. Chlorobenzene	108-90-7	1
34. Ethylbenzene	100-41-4	1
35. Styrene	100-42-5	1
36. Xylenes (total)	1330-20-7	1
37. 1,3-Dichlorobenzene	541-73-1	1
38. 1,4-Dichlorobenzene	106-46-7	1
39. 1,2-Dichlorobenzene	95-50-1	1
40. 1,2-Dibromo-3-chloropropane	96-12-8	1

NOTE: Except for Methylene chloride, the quantitation limits in this table are set at the concentrations in the sample equivalent to the concentration of the lowest calibration standard analyzed for each analyte.

In the case of Methylene chloride, the CRQL value in this table is based on the lowest level of detection in samples contaminated with this common laboratory solvent that can be achieved by reasonable means in a production laboratory.

**TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMITS (CROL)
(CONT'D.)**

Semivolatiles	CAS Number	Quantitation Limits
		Water ug/L
1. Phenol	108-95-2	5
2. bis-(2-Chloroethyl) ether	111-44-4	5
3. 2-Chlorophenol	95-57-8	5
4. 2-Methylphenol	95-48-7	5
5. 2,2'-oxybis(1-Chloropropane)	108-60-1	5
6. 4-Methylphenol	106-44-5	5
7. N-Nitroso-di-n-propylamine	621-64-7	5
8. Hexachloroethane	67-72-1	5
9. Nitrobenzene	98-95-3	5
10. Isophorone	78-59-1	5
11. 2-Nitrophenol	88-75-3	5
12. 2,4-Dimethylphenol	105-67-9	5
13. bis-(2-Chloroethoxy)methane	11-91-1	5
14. 2,4-Dichlorophenol	120-83-2	5
15. 1,2,4-Trichlorobenzene	120-82-1	5
16. Naphthalene	91-20-3	5
17. 4-Chloroaniline	106-47-8	5
18. Hexachlorobutadiene	87-68-3	5
19. 4-Chloro-3-methylphenol	59-50-7	5
20. 2-Methylnaphthalene	91-57-6	5
21. Hexachlorocyclopentadiene	77-47-4	5
22. 2,4,6-Trichlorophenol	88-06-2	5
23. 2,4,5-Trichlorophenol	95-95-4	20
24. 2-Chloronaphthalene	91-58-7	5
25. 2-Nitroaniline	88-74-4	20
26. Dimethylphthalate	131-11-3	5
27. Acenaphthylene	208-96-8	5
28. 2,6-Dinitrotoluene	606-20-2	5
29. 3-Nitroaniline	99-09-2	20
30. Acenaphthene	83-32-9	5
31. 2,4-Dinitrophenol	51-28-5	20
32. 4-Nitrophenol	100-02-7	20
33. Dibenzofuran	132-64-9	5

C-4

10/92

TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMITS (CQQL)
(CONT'D.)

Semivolatiles	CAS Number	Quantitation Limits
		Water ug/L
34. 2,4-Dinitrotoluene	121-14-2	5
35. Diethylphthalate	84-66-2	5
36. 4-Chlorophenyl-phenylether	7005-72-3	5
37. Fluorene	84-73-7	5
38. 4-Nitroaniline	100-01-6	20
39. 4,6-Dinitro-2-methylphenol	534-52-1	20
40. N-Nitrosodiphenylamine	86-30-6	5
41. 4-Bromophenyl-phenylether	101-53-3	5
42. Hexachlorobenzene	118-74-1	5
43. Pentachlorophenol	87-86-3	20
44. Phenanthrene	85-01-8	5
45. Anthracene	120-12-7	5
46. Di-n-butylphthalate	84-74-2	5
47. Fluoranthene	206-44-0	5
48. Pyrene	129-00-0	5
49. Butylbenzylphthalate	85-68-7	5
50. 3,3'-Dichlorobenzidine	91-94-1	5
51. Benzo(a)anthracene	56-55-3	5
52. Chrysene	218-01-9	5
53. bis-(2-Ethylhexyl)phthalate	117-81-7	5
54. Di-n-octylphthalate	117-84-0	5
55. Benzo(b)fluoranthene	205-99-2	5
56. Benzo(k)fluoranthene	207-08-9	5
57. Benzo(a)pyrene	50-32-8	5
58. Indeno(1,2,3-cd)pyrene	193-39-5	5
59. Dibenx(a,h)anthracene	53-70-3	5
60. Benzo(g,h,i)perylene	191-24-2	5

C-5

10/92

TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
(CONT'D.)

Pesticides/PCBs	CAS Number	Quantitation Limits
		Water ug/L
1. alpha-BHC	319-84-6	0.01
2. beta-BHC	319-85-7	0.01
3. delta-BHC	319-36-8	0.01
4. gamma-BHC (Lindane)	58-89-9	0.01
5. Heptachlor	76-44-8	0.01
6. Aldrin	309-00-2	0.01
7. Heptachlor epoxide	1024-57-3	0.01
8. Endosulfan I	959-98-8	0.01
9. Dieldrin	60-57-1	0.02
10. 4,4'-DDE	72-55-9	0.02
11. Endrin	72-20-8	0.02
12. Endosulfan II	33213-65-9	0.02
13. 4,4'-DDD	72-54-8	0.02
14. Endosulfan sulfate	1031-07-8	0.02
15. 4,4'-DDT	50-29-3	0.02
16. Methoxychlor	72-43-5	0.10
17. Endrin ketone	53494-70-5	0.02
18. Endrin aldehyde	7421-93-4	0.02
19. alpha-Chlordane	5103-71-9	0.01
20. gamma-Chlordane	5103-74-2	0.01
21. Toxaphene	8001-35-2	1.0
22. Aroclor-1016	12674-11-2	0.20
23. Aroclor-1221	11104-28-2	0.40
24. Aroclor-1232	11141-16-5	0.20
25. Aroclor-1242	53469-21-9	0.20
26. Aroclor-1248	12672-29-6	0.20
27. Aroclor-1254	11097-69-1	0.20
28. Aroclor-1260	11096-82-5	0.20

C-6

10/92

COPY

WATER WELL RECORD

WELL LOCATION (Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township _____
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

36 N 9 W NW 1/4 SE 1/4 Sec 14

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner R. Augustyn Address _____

Building Contractor _____ Address _____

Name of Well Drilling Contractor: Triange Drilling

Address _____

Name of Drilling Equipment Operator: _____

WELL INFORMATION

Depth of well: 178' Date well was completed: 6-13-57

Diameter of casing or drive pipe: 4" Total Length: _____

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: _____ Length: _____ Slot Size: _____

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other open hole

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: _____ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 36 feet

Bailer Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested 2 Rate 8 g.p.m. Drawdown 40 ft.

Signature _____

Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

WATER WELL LOG

[illegible]

COPY

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township _____
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

3/4 N 1/4 NW 1/4 SE 1/4 Sec 14

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner J. McLaughlin Address _____

Building Contractor _____ Address _____

Name of Well Drilling Contractor: Triangle Drilling Co.

Address _____

Name of Drilling Equipment Operator: _____

WELL INFORMATION

Depth of well: 200' Date well was completed: 9-24-57

Diameter of casing or drive pipe: 4" Total Length: _____

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: _____ Length: _____ Slot Size: _____

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other open hole

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 37' feet

Barler Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

Pumping Test: Hours Tested _____ Rate 12 g.p.m. Drawdown 3 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature _____

Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
 Cell of [redacted] does not contain any [redacted]

FOR ADMINISTRATIVE USE ONLY

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township St. John Twp
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Edward Hall Address 1836 Calhoun St - Griffith, Ind.

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: James A. Farmer

WELL INFORMATION

Depth of well: 62 ft Date well was completed: May 11-1973

Diameter of casing or drive pipe: 4" Total Length: 56'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 3" Length: 6 ft Slot Size: 006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate 16 g.p.m. Drawdown 0 ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested 2 Rate 14 g.p.m. Drawdown 0 ft.

Signature Adelma J. Langiardi - Secy. S.

Date July 19-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

WATER WELL LOG

(Well driller does not fill out)

COUNTY Leake TWP. 36 N RGE. 9 N $\frac{1}{4}$ $\frac{1}{4}$ SEC 13-24 Subdivision Name

Topo Map Highland 25

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

Fl W of EL. Ground Elevation _____

_F1 N of SL. Depth to bedrock_____

Bedrock elevation _____

Ft S of NL. Aquifer elevation _____ Lot Number _____

[illegible]

COPY

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Nake Civil Township _____
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

30 N 9W SE NE 14

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Superior Homes Address _____

Building Contractor _____ Address _____

Name of Well Drilling Contractor: Layne Northern Co., Inc.

Address _____

Name of Drilling Equipment Operator: _____

WELL INFORMATION

Depth of well: 21' Date well was completed: 10-12-48

Diameter of casing or drive pipe: 26" Total Length: _____

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 10' Length: 8" gauze size 29 slot size 51

Type of Well: Drilled ☒ Gravel Pack ☒ Driven ☐ Other _____

Use of Well: For Home ☐ For Industry ☐ For Public Supply ☒ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 2 feet

Bailer Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

Pumping Test: Hours Tested _____ Rate 18 g.p.m. Drawdown 16 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature _____

Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

WATER WELL LOG

[illegible]

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

State Form 356

COPY

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township North
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinct landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner _____ Address _____

Building Contractor _____ Address _____

Name of Well Drilling Contractor: _____

Address _____

Name of Drilling Equipment Operator: _____

WELL INFORMATION

Depth of well: 21 Date well was completed: _____

Diameter of casing or drive pipe: 26" Total Length: _____

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 8" Length: 10 Slot Size: 27

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☐ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 2 ft.

Bailer Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

Pumping Test: Hours Tested _____ Rate 18 g.p.m. Drawdown 16 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature _____

Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

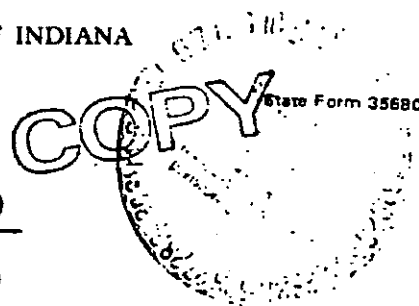
WATER WELL LOG

[illegible]

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204

Telephone 317-232-4160

WATER WELL RECORD



WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Ross Twp
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner H + N Airport Address 1701 E. Main St - Griffith Ind. 46322

Building Contractor _____ Address _____

Name of Well Drilling Contractor John Farmer & Sons Well & Pump Service Inc -

Address 9703 Kennedy Avenue - Highland - Indiana 46322

Name of Drilling Equipment Operator: Everett H. Farmer

WELL INFORMATION

Depth of well: 65 ft Date well was completed: Jan 4-1984

Diameter of casing or drive pipe: 4" Total Length: 59 ft.

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 4" Length: 6 ft Slot Size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☐ For Industry ☐ Batchrooms For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☒ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

Signature Cedema L. Angliardi - Secy-Treas.
Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

WATER WELL LOG

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. _____ RGE. _____ 1/4 _____ 1/4 _____ SEC. _____ Subdivision Name _____

Topo Map _____

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

 Ft W of EL. Ground Elevation

_____ Ft N of SL. Depth to bedrock _____

_____ Ft E of WL. Bedrock elevation _____

_____ Ft S of NL. Aquifer elevation _____ Lot Number _____

[illegible]

COPY

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46209
MEIrose 3-6757

37-8-31-H-1

WATER WELL RECORD

Sheet 9

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: _____

Congressional township: 37N Range: 8W Number of section: 31

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: _____

Div. US Steel.

Name of owner: American Bridge Address: _____

Name of Well Drilling Contractor: Raymond Concrete Pile Co

Address: _____

Name of Drilling Equipment Operator: _____

INFORMATION ON THE WELL

Completed depth of well: 30 ft. Date well was completed: _____

Diameter of outside casing or drive pipe: 50 feet dia Length: _____

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: _____ Length: _____ Slot size: _____

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☐ Other Dug

Use of Well: For home ☐ For industry ☒ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Driven ☐

Static water level in completed well (Distance from ground to water level) 7.40 ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Signature Bull 10 mtd of log card

Date Citing Mr Theil by Vig. mtd

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET all 4-1967

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

○

2

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

8

COPY A-5

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet
Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

RI 53 N to RT 12 - W on 12 approx 2 mi to
Clark Station go N 3 blocks - well located
SE corner of building

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Miss Continent Coke Co. Address PO BOX 6027 Bumswick Sta

Building Contractor _____ Address _____

Name of Well Drilling Contractor: Westbury Wells + Pump

Address 4382 Cleveland St. Gary Ind. 46403

Name of Drilling Equipment Operator: George Chalabis

WELL INFORMATION

Depth of well: 50' Date well was completed: 4-19-79

Diameter of casing or drive pipe: 4" Total Length: 50'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 4" Length: 5' Slot Size: 10

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☐ For Industry ☒ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☒ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 10 feet

Bailer Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

Pumping Test: Hours Tested _____ Rate 70 g.p.m. Drawdown 3 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Shawn Chalabis

Date 5-22-79

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

WATER WELL LOG

FOR ADMINISTRATIVE USE ONLY
(Well owner does not fill out)

COUNTY Waco TWP. 37N RGE. 9W SE 4 SE 4 NE 36 SEC

Topo Map Highway 74

Field Located By Date

Courthouse Location By Date

600 Ft W of EL

Ft N of SL

Ft E of WL

Ground Elevation

Depth to bedrock

Bedrock elevation

Aquifer elevation

538

Lot Number

Location accepted w/g verification by Field located in Lake-Roth Co Ground water Study Study

To 80 From 0'

To 50' From 20'

FORMATIONS (Color, type of material, hardness, etc.)

fine sand
coarse sand + gravel

Dec. 14 - 36/9W

602800N 465620E

36/9W-1441

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

WATER WELL RECORD

W W R S

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: Calumet

Congressional township: 26N Range: 9W Number of section: FE 11

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: West side of Colfax ave. #2250 Gary Ind.

(Rd. ridge back add 4137 Bk. 39-293-32; 4157 Bk. 39-293-32; 416 Bk. 39-289-16)

Bone Green (0.95 mi) 1.25 - 39 12125)

Name of owner: Cecil Oldham Address: 2250 Colfax ave Gary

Name of Well Drilling Contractor: Cummingham Well Service

Address: Porter Ind

Name of Drilling Equipment Operator: Mr Cummingham

INFORMATION ON THE WELL

Completed depth of well: 138 ft. Date well was completed: 4-4-60

Diameter of outside casing or drive pipe: 2" Length: 134 1/2 ft

Diameter of inside casing or liner: 1" Length: 105

Diameter of Screen: 1" Length: 3 1/2 ft Slot size: 60 gauge

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other ☐

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Driven ☒

Static water level in completed well (Distance from ground to water level) 75 ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 4 Rate 5 g.p.m. Drawdown 20 ft. (Difference between static level and water level at end of test)

Signature Mr Cummingham

Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
 Dr. [REDACTED] does not fill o

1050 S of NL	130 W of EL
--------------	-------------

concern
informal
ties.
11/12

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location. As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name..... Common Name..... State Fed.. Townrange Sec..... Date Comments.....

			036N008W	06		
BRUNSWICK CENTER SAVANNA						
PRAIRIE - SAND WET-MESIC	WET-MESIC SAND PRAIRIE	SG	037N008W	06	SWQ	1978
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG	037N008W	06	SWQ	1978
CEMETERY SAVANNA						
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG	036N009W	08	NWQ AND NEQ NEQ	1981
					S7	
CLARK AND PINE DUNE AND SWALE						
PRAIRIE - SAND DRY	DRY SAND PRAIRIE	SG	037N009W	36	NEQ	1978
SAVANNA - SAND DRY	DRY SAND SAVANNA	SG	037N009W	36	NWQ SEQ	1978
WETLAND - MARSH	MARSH	SG	037N009W	36	NEQ	1978
WETLAND - PANNE	PANNE	SG	037N009W	36	NEQ	1978
ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	SR	037N009W	36	SWQ NEQ	1991
ARISTIDA INTERMEDIA	SLIM-SPIKE THREE-AWN GRASS	SR	037N009W	36	SWQ NEQ	1986
ASTER SERICEUS	WESTERN SILVERY ASTER	SR	037N009W	36		1978
BETULA PAPYRIFERA	PAPER BIRCH	WL	037N009W	36	SWQ NEQ	1991
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	037N009W	36	SWQ NEQ	1991
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR	037N009W	36	SWQ NEQ	1991
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND-SQUIRREL	ST	036N008W	31	SWQ	1987
CLARK AND PINE GEN. REFRACTORIES ADDITION						
ARENARIA STRICTA	MICHAUX'S STITCHWORT	SR	037N009W	25		1978
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST	037N009W	36	3.9	1978
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	SE	037N009W	36	3.9	1978
CHLIDONIAS NIGER	BLACK TERN	SE C2	037N009W	36	3.9 OR 25	1978
IXOBRYCHUS EXILIS	LEAST BITTERN	SSG	037N009W	36		1978
RALLUS ELEGANS	KING RAIL	SE	037N009W	36	3.9	1978
RALLUS LIMICOLA	VIRGINIA RAIL	SSG	037N009W	36		1978
PRAIRIE - SAND DRY	DRY SAND PRAIRIE	SG	037N009W	36	NEQ	1978
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG	037N009W	36		1978
WETLAND - MARSH	MARSH	SG	037N009W	36	NEQ	1978
WETLAND - PANNE	PANNE	SG	037N009W	36	NEQ	1978
AMMOPHILA BREVILIGULATA	MARRAM GRASS	WL	037N009W	36		1898
ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	SR	037N009W	36		1978
ARISTIDA INTERMEDIA	SLIM-SPIKE THREE-AWN GRASS	SR	037N009W	36	NH	1991
BETULA PAPYRIFERA	PAPER BIRCH	WL	037N009W	36	NH	1991
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR	037N009W	36		1978
CAREX CRAWEI	CRAWE SEDGE	ST	037N009W	36	3.9	1956
CEANOTHUS HERBACEUS	PRAIRIE REDROOT	SR	037N009W	36		1903
CORNUS RUGOSA	ROUNDLEAF DOGWOOD	SR	037N009W	36		1920
CYPRIPEDIUM CALCEOLUS VAR	SMALL YELLOW LADY'S-SLIPPER	SR	037N009W	36		1978
PARVIFLORUM						
CYPRIPEDIUM CANDIDUM	SMALL WHITE LADY'S-SLIPPER	SR 3C	037N009W	36		1897
DROSEROTA ROTUNDIFOLIA	ROUNDLEAF SUNDEW	WL	037N009W	36		1875
ELEOCHARIS GENICULATA	CAPITATE SPIKE-RUSH	ST	037N009W	36	2.9 NH	1991
ELEOCHARIS PAUCIFLORA	FEWFLOWER SPIKERUSH	WL	037N009W	36	NH	1991
ERIOPHORUM ANGUSTIFOLIUM	NARROW-LEAVED COTTON-GRASS	SR	037N009W	36	NH	1982
ERIOPHORUM GRACILE	SLENDER COTTON-GRASS	ST	037N009W	36	3.9	1934
GERARDIA SKINNERIANA	PALE FALSE FOXGLOVE	SE C2	037N009W	36	3.9	1991
			037N009W	25		
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	037N009W	36	CENTER NEQ	1991
			037N009W	25	SH SWQ	
JUNCUS BALTICUS VAR LITTORALIS	BALTIC RUSH	SR	037N009W	36		1991
			037N009W	25		
LIPARIS LOESELII	LOESEL'S TWAYBLADE	WL	037N009W	36		1978
			037N009W	25		
OROBANCHE FASCICULATA	CLUSTERED BROOMRAPE	SE	037N009W	36	3.9	1926
PINUS BANKSIANA	JACK PINE	SR	037N009W	36		1978
PLATANHERA CLAVELLATA	SMALL GREEN WOODLAND ORCHIS	SR	037N009W	36		1879
PLATANHERA FLAVA VAR HERBIOLA	PALE GREEN ORCHIS	WL	037N009W	36		1978
PLATANHERA HYPERBOREA	LEAFY NORTHERN GREEN ORCHIS	ST	037N009W	36	3.9	1978
RHAMNUS ALNIFOLIA	ALDERLEAF BUCKTHORN	WL	037N009W	36		1923

STATE: SX-extirpated, SE-endangered, ST-threatened, SR-rare, SSG-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, C1-proposed to be listed, C2-under review, 3C-delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name	Common Name	State Fed.	Townrange	Sec.	Date	Comments
RHUS AROMATICA VAR ARENARIA	BEACH SUMAC	ST	C2	037N009W 36	3.5 NEQ	1923
SATUREJA GLABELLA VAR ANGSTIFOLIA	CALAMINT	SE		037N009W 36	7A	1895
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR		037N009W 36	CENTER NEQ	1991
SPIRANTHES LUCIDA	SHINING LADIES'-TRESSES	SR		037N009W 25	SH SWQ	1934
UTRICULARIA CORNUTA	HORNED BLADDERWORT	ST		037N009W 36	3.9	1893
UTRICULARIA INTERMEDIA	FLATLEAF BLADDERWORT	WL		037N009W 36		1898
UTRICULARIA MINOR	LESSER BLADDERWORT	SE		037N009W 36	3.5	1897
CYPRIPEDIUM CALCEOLUS VAR PARVIFLORUM	SMALL YELLOW LADY'S-SLIPPER	SR		037N009W 36	NEQ	1989
CLINE AVENUE DUNE AND SWALE SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG		036N009W 03	NEQ NEQ, SEQ	1978
WETLAND - SWAMP SHRUB	SHRUB SWAMP	SG		036N009W 03	NEQ NEQ & SEQ	1978
BETULA PAPYRIFERA	PAPER BIRCH	WL		036N009W 03	NEQ NEQ, SEQ	1978
CYPRIPEDIUM CALCEOLUS VAR PUBESCENS	LARGE YELLOW LADY'S-SLIPPER	WL		036N009W 03	NEQ NEQ, SEQ	1978
DIERVILLA LONICERA	NORTHERN BUSH-HONEYSUCKLE	SR		036N009W 03	NEQ NEQ	1978
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL		036N009W 03	NEQ NEQ, SEQ	1978
PLATANThERA FLAVA VAR HERBIOLA	PALE GREEN ORCHIS	WL		036N009W 03	NEQ NEQ, SEQ	1978
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG		036N009W 33	NEQ NEQ & SEQ	1978
DUPONT SITE						
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST		037N009W 34	SEQ 1.9	1990
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	SE		037N009W 34	SWQ 1.9	1991
CHLIDONIAS NIGER	BLACK TERN	SE	C2	037N009W 34	SWQ 1.9	1991
CISTOTHORUS PALUSTRIS	MARSH WREN	SSC		037N009W 34	SWQ	1991
EMPIDONAX MINIMUS	LEAST FLYCATCHER	WL		037N009W 34	SEQ	1991
IXOBRYCHUS EXILIS	LEAST BITTERN	SSC		037N009W 34	SWQ	1991
RALLUS ELEGANS	KING RAIL	SE		037N009W 34	SEQ 1.9	1974
RALLUS LIMICOLA	VIRGINIA RAIL	SSC		037N009W 34	SWQ	1991
XANTHOCEPHALUS XANTHOCEPHALUS	YELLOW-HEADED BLACKBIRD	ST		037N009W 34	SWQ 1.9	1991
EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	SSC	C2	037N009W 34	SH 1.9	1991
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG		037N009W 34	SEQ	1978
PRAIRIE - SAND WET-MESIC	WET-MESIC SAND PRAIRIE	SG		037N009W 34	SEQ	1978
SAVANNA - SAND DRY	DRY SAND SAVANNA	SG		037N009W 34	SEQ	1978
WETLAND - MARSH	MARSH	SG		037N009W 34	SEQ	1978
WETLAND - MEADOW SEDGE	SEdge MEADOW	SG		037N009W 34	SEQ	1978
BETULA PAPYRIFERA	PAPER BIRCH	WL		037N009W 34	SEQ	1991
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR		037N009W 34	SEQ	1991
PLATANThERA FLAVA VAR HERBIOLA	PALE GREEN ORCHIS	WL		037N009W 34	SEQ	1991
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR		037N009W 34	SEQ NWQ SEQ	1992
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST		036N009W 03	SWQ 1.6	1986
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST		036N009W 03	SWQ 1.6	1986
LYCAEIDES MELISSA SAMUELIS	KARNER BLUE BUTTERFLY	SE	LE	036N009W 04	NEQ 1.75	1992
				036N009W 03	NEQ 1.8	
GRAND CALUMET RIVER TERN SITE						
CASMERODIUS ALBUS	GREAT EGRET	SE		037N009W 33	NEQ SEQ 1.2	1988
CHLIDONIAS NIGER	BLACK TERN	SE	C2	037N009W 33	N 1/2 SEQ 1.2	1987
CISTOTHORUS PALUSTRIS	MARSH WREN	SSC		037N009W 33	SEQ	1987
ELEOCHARIS WOLFII	WOLF SPIKERUSH	ST	C2	036N009W 33	SEQ 1.2	1994
				035N009W 04	NEQ	
IVANHOE DUNE AND SWALE						
LYCAEIDES MELISSA SAMUELIS	KARNER BLUE BUTTERFLY	SE	LE	036N009W 02	SEQ 2.0	1993
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG		036N009W 02	SEQ	1978
ROXANA POND						
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST		037N009W 32	NEQ SWQ 1	1985

STATE: SX=extirpated, SE=endangered, ST=threatened, SR=rare, SSC=special concern, WL=watch list, SG=significant
FEDERAL: LE=endangered, LT=threatened, C1=proposed to be listed, C2=under review, 3C=delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name..... Common Name..... State Fed.. Townrange Sec..... Date Comments.....

CHLIDONIAS NIGER	BLACK TERN	SE	C2	037N009W	32	CENTER, W1/2.	1989 /
						AND SWQ	
CISTOTHORUS PALUSTRIS	MARSH WREN	SSC		037N009W	32	SWQ	1985
IXOBRYCHUS EXILIS	LEAST BITTERN	SSC		037N009W	32	SWQ	1984
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	SE		037N009W	32	SWQ	1986 /
XANTHOCEPHALUS XANTHOCEPHALUS	YELLOW-HEADED BLACKBIRD	ST		037N009W	32	SWQ	1984 /
RANA PIPIENS	NORTHERN LEOPARD FROG	SSC		037N009W	32	SWQ	1984
						NEQ S10	

TOLLESTON WOODS							
PRAIRIE - SAND WET	WET SAND PRAIRIE	SSC		036N009W	13	N HALF NEQ	1982
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SSC		036N009W	13	N HALF NEQ	1982

CLARK AND PINE EAST (DNR NATURE PRESERVES)							
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST		036N008W	31	SWQ	1987
SISTRURUS CATENATUS CATENATUS	EASTERN MASSASAUGA	ST	C2	036N008W	31	SWQ	1984
CISTOTHORUS PALUSTRIS	MARSH WREN	SSC		037N008W	31	NWQ	1991
IXOBRYCHUS EXILIS	LEAST BITTERN	SSC		037N008W	31	NWQ	1991
RALLUS LIMICOLA	VIRGINIA RAIL	SSC		037N008W	31	NWQ	1991
CLEMMYS GUTTATA	SPOTTED TURTLE	ST		037N008W	31	NWQ	1991
EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	SSC	C2	037N008W	31	NWQ	1991
OPHISAURUS ATTENUATUS	SLENDER GLASS LIZARD			037N008W	31	NWQ	1990
ATRYTONOPSIS HIANNA	DUSTED SKIPPER	ST		037N008W	31	NWQ	1986
ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	SR		037N008W	31	WH	1991
BETULA PAPYRIFERA	PAPER BIRCH	WL		037N008W	31	NWQ	1991
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR		037N008W	31	WH	1991
CAREX BRUNNESCENS	BROWNISH SEDGE	SE		037N008W	31	WH	1991
CAREX CRAWEI	CRAWE SEDGE	ST		037N008W	31	WH	1991
CAREX GARBERI	ELK SEDGE	ST		037N008W	31	WH	1991
CAREX RICHARDSONII	RICHARDSON SEDGE	SE		037N008W	31	WH	1956
CIRSIIUM HILLII	HILL'S THISTLE	SE	C2	037N008W	31	NWQ	1987
CYPRIPEDUM CALCEOLUS VAR	SMALL YELLOW LADY'S-SLIPPER	SR		037N008W	31	NWQ	1989
PARVIFLORUM							
ELEOCHARIS GENICULATA	CAPITATE SPIKE-RUSH	ST		037N008W	31	WH	1991
ELEOCHARIS PAUCIFLORA	FEWFLOWER SPIKERUSH	WL		037N008W	31	WH	1991
GERARDIA SKINNERIANA	PALE FALSE FOXGLOVE	SE	C2	037N008W	31	WH	1990
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL		037N008W	31	NWQ	1991
JUNCUS BALTICUS VAR LITTORALIS	BALTIC RUSH	SR		037N008W	31	WH	1991
LIPARIS LOESELII	LOESEL'S TWAYBLADE	WL		037N008W	31	WH	1991
MELAMPYRUM LINEARE	AMERICAN COW-WHEAT	SR		037N008W	31		1907
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR		037N008W	31	WH	1991
TOFIELDIA GLUTINOSA	FALSE ASPHODEL	SR		037N008W	31	WH	1991

CLARK AND PINE NATURE PRESERVE (DNR NATURE PRESERVES)
LAND AND WATER CONSERVATION FUND SITE #18-00405

ARISTIDA INTERMEDIA	SLIM-SPIKE THREE-AWN GRASS	SR		036N009W	36		1927
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST		037N009W	36	NEQ 3.5	1986
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	SE		037N009W	36	NEQ 3.8	1978
IXOBRYCHUS EXILIS	LEAST BITTERN	SSC		037N009W	36	NEQ	1988
RALLUS ELEGANS	KING RAIL	SE		037N009W	36	NEQ 3.5	1978
RALLUS LIMICOLA	VIRGINIA RAIL	SSC		037N009W	36		1978
CLEMMYS GUTTATA	SPOTTED TURTLE	ST		037N009W	36	NEQ 3.8	1990
EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	SSC	C2	037N009W	36	NEQ 3.8	1988
OPHISAURUS ATTENUATUS	SLENDER GLASS LIZARD			037N009W	36	NEQ	1991
THAMNOPHIS PROXIMUS	WESTERN RIBBON SNAKE	SSC		037N009W	36	NEQ	1987
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER	SSC		037N009W	36		1978
				037N009W	25		
ATRYTONOPSIS HIANNA	DUSTED SKIPPER	ST		037N009W	36	NEQ 3.8	1986
ERYNNIS HORATIUS	HORACE'S DUSKYWING			037N009W	36	NEQ	1985
EUPHYES DION	SEGE SKIPPER			037N009W	36	NEQ	1986
HESPERIA LEONARDUS	LEONARDUS SKIPPER	SR		037N009W	36	NEQ	1985
HESPERIA OTTOE	OTTOE SKIPPER	SE		037N009W	36	NEQ 3.5	1986
LYCAENA XANTHOIDES	GREAT COPPER	WL		037N009W	36	NEQ	1985
PROBLEMA BYSSUS	BUNCHGRASS SKIPPER	SR		037N009W	36	NEQ	1985
SCHINIA GLORIOSA	GLORIOUS FLOWER MOTH	WL		037N009W	36	NEQ	1986
PRAIRIE - SAND DRY	DRY SAND PRAIRIE	SSC		037N009W	36	NEQ	1978
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SSC		037N009W	36	NEQ	1978

STATE: SX-extirpated, SE-endangered, ST-threatened, SR-rare, SSC-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, CI-proposed to be listed, C2-under review, 3C-delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name	Common Name	State	Fed.	Townrange	Sec.	Date	Comments
PRAIRIE - SAND WET-MESIC	WET-MESIC SAND PRAIRIE	SG		037N009W	36	NEQ	1980
SAVANNA - SAND DRY-	DRY SAND SAVANNA	SG		037N009W	36	NEQ	1978
WETLAND - MARSH	MARSH	SG		037N009W	36	NEQ	1978
WETLAND - PANNE	PANNE	SG		037N009W	36	NEQ	1984
AMELANCHIER HUMILIS	RUNNING SERVICEBERRY	SE		037N009W	36	NEQ	1985
ARALIA HISPIDA	BRISTLY SARSAPARILLA	SE		037N009W	36	NEQ	1880
ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	SR		037N009W	36	NEQ	1985
ARENARIA STRICTA	MICHAUX'S STITCHWORT	SR		037N009W	36	NEQ	1986
ASTER JUNCIFORMIS	RUSHLIKE ASTER	SR		037N009W	36	NEQ	1985
BETULA PAPYRIFERA	PAPER BIRCH	WL		037N009W	36	NEQ	1986
BUCHNERA AMERICANA	BLUEHEARTS	SE		037N009W	36	NWQ	1991
CAKILE EDENTULA VAR LACUSTRIS	AMERICAN SEA-ROCKET	WL		037N009W	36		1915
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR		037N009W	36	NEQ	1986
CAREX CRAWEI	CRAWE SEDGE	ST		037N009W	36	NEQ	1987
CAREX EBURNEA	EBONY SEDGE	SR		037N009W	36	NEQ	1986
CAREX GARBERI	ELK SEDGE	ST		037N009W	36	NEQ	1986
CAREX RICHARDSONII	RICHARDSON SEDGE	SE		037N009W	36	NEQ	1986
CIRSIIUM HILLII	HILL'S THISTLE	SE	C2	037N009W	36	NEQ	1987
COELOGLOSSUM VIRIDE VAR	LONG-BRACT GREEN ORCHIS	ST		037N009W	36		HIST
VIRESCENS							
CORNUS CANADENSIS	BUNCHBERRY	SE		037N009W	36		1878
CYPRIPEDIUM CALCEOLUS VAR	SMALL YELLOW LADY'S-SLIPPER	SR		037N009W	36	NEQ	1989
PARVIFLORUM							
CYPRIPEDIUM CANDIDUM	SMALL WHITE LADY'S-SLIPPER	SR	3C	037N009W	36		1898
ELEOCHARIS GENICULATA	CAPITATE SPIKE-RUSH	ST		037N009W	36	SEQ	1986
ELEOCHARIS PAUCIFLORA	FEWFLOWER SPIKERUSH	WL		037N009W	36	NEQ	1986
EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	SE		037N009W	36		1955
ERIOPHORUM ANGUSTIFOLIUM	NARROW-LEAVED COTTON-GRASS	SR		037N009W	36	NEQ	1986
ERIOPHORUM GRACILE	SLENDER COTTON-GRASS	ST		037N009W	36		1934
EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	WL		037N009W	36	NEQ	1899
GERARDIA SKINNERIANA	PALE FALSE FOXGLOVE	SE	C2	037N009W	36	NWQ	1991
						NEQ	
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL		037N009W	36	NEQ	1986
JUNCUS BALTICUS VAR LITTORALIS	BALTIC RUSH	SR		037N009W	36	NEQ	1985
JUNCUS SCIRPOIDES	SCIRPUS-LIKE RUSH	ST		037N009W	36	NEQ	1985
LINNAEA BOREALIS	TWINFLOWER	SR		037N009W	36		1897
LIPARIS LOESELII	LOESEL'S TWAYBLADE	WL		037N009W	36	NEQ	1989
LUDWIGIA SPHAEROCARPA	GLOBE-FRUITED	SE		037N009W	36		1952
	FALSE-LOOSESTRIFE						
MELAMPYRUM LINEARE	AMERICAN COW-WHEAT	SR		037N009W	36		1907
OROBANCHE FASCICULATA	CLUSTERED BROOMRAPE	SE		037N009W	36	NEQ	1986
PINUS BANKSIANA	JACK PINE	SR		037N009W	36	NEQ	1986
PLATANThERA CLAVELLATA	SMALL GREEN WOODLAND ORCHIS	SR		037N009W	36		1879
PLATANThERA FLAVA VAR HERBIOIA	PALE GREEN ORCHIS	WL		037N009W	36		1928
PLATANThERA HYPERBOREA	LEAFY NORTHERN GREEN ORCHIS	ST		037N009W	36	NEQ	1986
POGONIA OPHIOGLOSSOIDES	ROSE POGONIA	WL		037N009W	36		1912
POTAMOGETON PULCHER	SPOTTED PONDWEED	SE		037N009W	36		1897
RHAMNUS ALNIFOLIA	ALDERLEAF BUCKTHORN	WL		037N009W	36	NEQ	1989
RHUS AROMATICA VAR ARENARIA	BEACH SUMAC	ST	C2	037N009W	36	NEQ	1986
SALIX CORDATA	HEARTLEAF WILLOW	ST		037N009W	36		1898
SATUREJA GLABELLA VAR	CALAMINT	SE		037N009W	36		1926
ANGUSTIFOLIA							
SCIRPUS SUBTERMINALIS	WATER BULRUSH	SR		037N009W	36		1878
SHEPHERDIA CANADENSIS	CANADA BUFFALO-BERRY	SR		037N009W	36	NEQ	1955
SISYRINCHIUM MONTANUM	STRICT BLUE-EYED-GRASS	SE		037N009W	36	NEQ	1986
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR		037N009W	36	NWQ	1991
SPIRANTHES LUCIDA	SHINING LADIES'-TRESSES	SR		037N009W	36		1934
SPIRANTHES MAGNICAMPORUM	GREAT PLAINS LADIES'-TRESSES	SE		037N009W	36	NWQ	1991
THUJA OCCIDENTALIS	NORTHERN WHITE CEDAR	SE		037N009W	36		1898
TOFIELDIA GLUTINOSA	FALSE ASPHODEL	SR		037N009W	36	NEQ	1986
TRIGLOCHIN PALUSTRE	MARSH ARROW-GRASS	ST		037N009W	36		1896
UTRICULARIA CORNUTA	HORNED BLADDERWORT	ST		037N009W	36		1916
UTRICULARIA MINOR	LESSER BLADDERWORT	SE		037N009W	36		1897
UTRICULARIA PURPUREA	PURPLE BLADDERWORT	SR		037N009W	36	NEQ	1986

GIBSON WOODS NATURE PRESERVE (LOCAL-LAKE CO. PARKS & RECREATION)

STATE: SX-extirpated, SE-endangered, ST-threatened, SR-rare, SSC-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, CI-proposed to be listed, C2-under review, 3C-delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name.....	Common Name.....	State Fed...	Townrange Sec.....	Date	Comments.....
PRAIRIE - SAND WET-MESIC	WET-MESIC SAND PRAIRIE	SG	036N009W 02	SWQ (+ S3 & S4)	1978
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG	036N009W 02	SWQ & S3 & S4	1978
SPERMOPHILUS FRANKLINII	FRANKLIN'S GROUND SQUIRREL	ST	036N009W 03	SWQ 1.6	1986
IXOBRYCHUS EXILIS	LEAST BITTERN	SSC	036N009W 03	SEQ	1985
OPHISAURUS ATTENUATUS	SLENDER GLASS LIZARD	SSC	036N009W 03	NH SH	1981
THAMNOPHIS PROXIMUS	WESTERN RIBBON SNAKE	SSC	036N009W 03	SH	1991
EUCHLOE OLYMPIA	OLYMPIA MARBLEWING	ST	036N009W 03	SWQ 1.6	1990
PAPAIPEMA LEUCOSTIGMA	COLUMBINE BORER	WL	036N009W 03	NH SH	1990
PAPAIPEMA PTERISII	BRACKEN BORER MOTH	WL	036N009W 03	NH SH	1992
PROBLEMA BYSSUS	BUNCHGRASS SKIPPER	SR	036N009W 03	NH SH	1990
FOREST - FLOODPLAIN WET-MESIC	WET-MESIC FLOODPLAIN FOREST	SG	036N009W 03	SH, EH S4, SWQ S2	1978
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG	036N009W 03	S HALF. + S2.4	1978
WETLAND - MARSH	MARSH	SG	036N009W 03	S HALF. + S2.4	1978
WETLAND - SWAMP SHRUB	SHRUB SWAMP	SG	036N009W 03	S HALF. + S2.4	1978
ALNUS RUGOSA	SPECKLED ALDER	WL	036N009W 03	SH	1978
BAPTISIA LEUCOPHAEA	CREAM WILD-INDIGO	WL	036N009W 03	SH	1978
BETULA PAPYRIFERA	PAPER BIRCH	WL	036N009W 03	SWQ	1986
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR	036N009W 03	SWQ	1978
CYPRIPEDIUM CALCEOLUS VAR PARVIFLORUM	SMALL YELLOW LADY'S-SLIPPER	SR	036N009W 04	EH	
CYPRIPEDIUM CALCEOLUS VAR PUBESCENS	LARGE YELLOW LADY'S-SLIPPER	WL	036N009W 03	NH SH	1991
CYPRIPEDIUM REGINAE	SHOWY LADY'S-SLIPPER	WL	036N009W 03	SH	1989
DIERVILLA LONICERA	NORTHERN BUSH-HONEYSUCKLE	SR	036N009W 04	NH SEQ	
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	036N009W 02	NH SWQ SWQ	
JUGLANS CINEREA	BUTTERNUT	WL C2	036N009W 03	SH	1978
LIPARIS LOESELII	LOESEL'S TWAYBLADE	WL	036N009W 03	NH SEQ	1978
PLATANThERA FLAVA VAR HERBIOLA	PALE GREEN ORCHIS	WL	036N009W 04	NH SWQ SWQ	
PLATANThERA LACERA	GREEN-FRIDGE ORCHIS	WL	036N009W 02	NH SH	1986
POGONIA OPHIOGLOSSOIDES	ROSE POGONIA	WL	036N009W 03	SH	1978
PRUNUS PENSYLVANICA	FIRE CHERRY	SR	036N009W 03	SWQ NEQ SEQ	1989
RHUS AROMATICA VAR ARENARIA	BEACH SUMAC	ST	036N009W 03	NH SH 1.6	1989
SATUREJA GLABELLA VAR ANGUSTIFOLIA	CALAMINT	SE	036N009W 03	NH SH 1.6	1906
LYCAEIDES MELISSA SAMUELIS	KARNER BLUE BUTTERFLY	SE	036N009W 02	NEQ 2.0	
GERARDIA GATTINGERI	ROUNDSTEM FOXGLOVE	WL	036N009W 04	NEQ 1.6	1992
IVANHOE NATURAL AREA (THE NATURE CONSERVANCY)				NEQ NEQ SEQ	1991
CERTHIA AMERICANA	BROWN CREEPER	WL	036N009W 02	NEQ	1991
RALLUS LIMICOLA	VIRGINIA RAIL	SSC	036N009W 02	NEQ	1991
EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	SSC C2	036N009W 02	SWQ SWQ NEQ	1991 2.8
OPHISAURUS ATTENUATUS	SLENDER GLASS LIZARD	SSC	036N009W 02	NEQ	1990 2.8
AMBYSTOMA LATIALE	BLUE-SPOTTED SALAMANDER	SSC	036N009W 02	NEQ	1991 2.8
LYCAEIDES MELISSA SAMUELIS	KARNER BLUE BUTTERFLY	SE	036N009W 02	NEQ	1992
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG	036N009W 02	NEQ	1978
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG	036N009W 02	EH NEQ	1978
PRAIRIE - SAND WET	WET SAND PRAIRIE	SG	036N009W 02	NEQ	1978
PRAIRIE - SAND WET	WET SAND PRAIRIE	SG	036N009W 02	EH NEQ	1978
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG	036N009W 02	NEQ	1978
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG	036N009W 02	EH NEQ	1978
WETLAND - MARSH	MARSH	SG	036N009W 02	NEQ	1978
WETLAND - MARSH	MARSH	SG	036N009W 02	EH NEQ	1978

STATE: SX-extirpated, SE-endangered, ST-threatened, SR-rare, SSC-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, C1-proposed to be listed, C2-under review, 3C-delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name.....	Common Name.....	State Fed..	Townrange	Sec.....	Date	Comments.....
WETLAND - SWAMP SHRUB	SHRUB SWAMP	SG	036N009W	02	NEQ	1978
WETLAND - SWAMP SHRUB	SHRUB SWAMP	SG	036N009W	02	EH NEQ	1978
ALNUS RUGOSA	SPECKLED ALDER	WL	036N009W	02	NEQ	1985
BETULA Papyrifera	PAPER BIRCH	WL	036N009W	02	NEQ	1978
CYPRIPEDIUM CALCEOLUS VAR PUBESCENS	LARGE YELLOW LADY'S-SLIPPER	WL	036N009W	02	NEQ	1978
CYPRIPEDIUM REGINAE	SHOWY LADY'S-SLIPPER	WL	036N009W	02	NEQ	1985
DIERVILLA LONICERA	NORTHERN BUSH-HONEYSUCKLE	SR	036N009W	02	NEQ	1985
JUNCUS BALTICUS VAR LITTORALIS	BALTIC RUSH	SR	036N009W	02	NEQ	1985
PLATANThERA HYPERBOREA	LEAFY NORTHERN GREEN ORCHIS	ST	036N009W	02	NEQ	1985
PRUNUS PENsYLVANICA	FIRE CHERRY	SR	036N009W	02	NEQ	1985
RHUS AROMATICA VAR ARENARIA	BEACH SUMAC	ST C2	036N009W	02	NEQ 7.0	1985
VIOLA PUBESCENS	DOWNY YELLOW VIOLET	WL	036N009W	02	NEQ	1985
<u>TOLLESTON RIDGES NATURE PRESERVE (LOCAL-LAKE CO. PARKS AND RECREATION)</u>						
<u>LAND AND WATER CONSERVATION FUND SITE #0386</u>						
Spermophilus Franklinii	FRANKLIN'S GROUND SQUIRREL	ST ✓	036N009W	03	NWQ 1.0	1978
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	SE	036N009W	03	NH 1.0	1975
BUTEO LINEATUS	RED-SHOULDERED HAWK	SSC	036N009W	03	N HALF SEQ	1978
EMYOIDEA BLANDINGII	BLANDING'S TURTLE	SSC C2	036N009W	03	SEQ NWQ	1986
LYCAIDES MELISSA SAMUELIS	KARNER BLUE BUTTERFLY	SE LE	036N009W	03	CENTER NH 1.0	1993
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG	036N009W	03	N HALF N HALF SEQ	1978
SAVANNA - SAND DRY-MESIC	DRY-MESIC SAND SAVANNA	SG	036N009W	03	N HALF SEQ	1978
WETLAND - MARSH	MARSH	SG	036N009W	03	N HALF N HALF SEQ	1978
WETLAND - SWAMP SHRUB	SHRUB SWAMP	SG	036N009W	03	N HALF SEQ	1978
ALNUS RUGOSA	SPECKLED ALDER	WL	036N009W	03	SEQ NWQ & SWQ	1978
BAPTISIA LEUCOPHAEA	CREAM WILD-INDIGO	WL	036N009W	03	SEQ NWQ & SWQ	1978
BETULA Papyrifera	PAPER BIRCH	WL	036N009W	03	SEQ NWQ & SWQ	1978
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR	036N009W	03	SEQ NWQ & SWQ	1978
CAREX RICHARDSONII	RICHARDSON SEDGE	SE	036N009W	03	SEQ NWQ & SWQ	1980 1.6
CYPRIPEDIUM CALCEOLUS VAR PARVIFLORUM	SMALL YELLOW LADY'S-SLIPPER	SR	036N009W	03	NEQ	1987
CYPRIPEDIUM CALCEOLUS VAR PUBESCENS	LARGE YELLOW LADY'S-SLIPPER	WL	036N009W	03	SEQ NWQ & SWQ	1978
CYPRIPEDIUM REGINAE	SHOWY LADY'S-SLIPPER	WL	036N009W	03	SEQ NWQ & SWQ	1978
CYPRIPEDIUM X ANDREWSII	ANDREW'S LADY'S-SLIPPER	SE	036N009W	03	NEQ	1991 1.0
DIERVILLA LONICERA	NORTHERN BUSH-HONEYSUCKLE	SR	036N009W	03	SEQ NWQ & SWQ	1991
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	036N009W	03	SEQ NWQ & SWQ	1974
LIPARIS LOESELII	LOESEL'S TWAYBLADE	WL	036N009W	03	SEQ NWQ & SWQ	1978
PLATANThERA FLAVA VAR HERBIOLA	PALE GREEN ORCHIS	WL	036N009W	03	NH AND NH SEQ	1978
PLATANThERA LACERA	GREEN-FRIDGE ORCHIS	WL	036N009W	03	NH AND NH SEQ	1978
POGONIA OPHIOGLOSSOIDES	ROSE POGONIA	WL	036N009W	03	SEQ NWQ & SWQ	1978
PRUNUS PENsYLVANICA	FIRE CHERRY	SR	036N009W	03	SEQ NWQ & SWQ	1978
SOLIDAGO SIMPLEX VAR GILLMANII	STICKY GOLDENROD	ST C2	036N009W	03	NWQ	1978 1.0
SPIRANTHES LUCIDA	SHINING LADIES' -TRESSES	SR	036N009W	03	SEQ NWQ & SWQ	1989
<u>LAND AND WATER CONSERVATION FUND SITE #18-00417 - CHESAPEAKE & OHIO ABANDONED RAILROAD</u>						
<u>LAND AND WATER CONSERVATION FUND SITE #18-00377 - MAIN SCHOOL</u>			036N009W	21	SEQ	
<u>LAND AND WATER CONSERVATION FUND SITE #0040 - HOMESTEAD PARK</u>			036N009W	16		

STATE: SX=extirpated, SE=endangered, ST=threatened, SR=rare, SSC=special concern, WL=watch list, SG=significant
FEDERAL: LE=endangered, LT=threatened, CI=proposed to be listed, C2=under review, 3C=delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name..... Common Name..... State Fed... Townrange Sec..... Date Comments.....

LAND AND WATER CONSERVATION FUND SITE #0189, 005 - DOWLING PARK

036N009W 16 NEQ

LAND AND WATER CONSERVATION FUND SITE #0194 - MAYWOOD PARK

036N009W 06

LAKE CALUMET QUADRANGLE

EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	SSC C2	037N010W	24	WH NWQ NEQ	1979
AMMOPHILA BREVILIGULATA	MARRAM GRASS	WL	038N010W	36	NEQ SWQ	1992
CAKILE EDENTULA VAR LACUSTRIS	AMERICAN SEA-ROCKET	WL	038N010W	36	NEQ SWQ	1992
EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	WL	038N010W	36	NEQ SWQ	1992

WHITING QUADRANGLE

ACIPENSER FULVESCENS	LAKE STURGEON	SE C2			IN LAKE	1910
----------------------	---------------	-------	--	--	---------	------

ARENARIA STRICTA

MICHAUX'S STITCHWORT

~~SR~~

EDGEMOOR & PINE
0.5 MI N OF
PINE STATION

CAKILE EDENTULA VAR LACUSTRIS
CAKILE EDENTULA VAR LACUSTRIS
EUPHORBIA POLYGONIFOLIA
EUPHORBIA POLYGONIFOLIA
GERARDIA SKINNERIANA

AMERICAN SEA-ROCKET
AMERICAN SEA-ROCKET
SEASIDE SPURGE
SEASIDE SPURGE
PALE FALSE FOXGLOVE

~~WL~~
~~WL~~
~~WL~~
~~WL~~
SE C2

037N009W 23
037N009W 06
037N009W 06
037N009W 23

SEQ & SWQ
CENTER
CENTER
SEQ & SWQ
N OF PINE
STATION.

1994
1992
1992
1994
1916 3.6

EUPHAGUS CYANOCEPHALUS
ARENARIA STRICTA

BREWER'S BLACKBIRD
MICHAUX'S STITCHWORT

~~SX~~
~~SR~~

037N009W
037N009W

WHITING
NEAR IND.
HARBOR

1965
1907

BUCHNERA AMERICANA

BLUEHEARTS

SE ✓

037N009W

NEAR IND.
HARBOR

1907 3.6

CAREX CRAWEI
CIRSIIUM PITCHERI
CIRSIIUM PITCHERI
EQUISETUM VARIEGATUM
EUPHORBIA POLYGONIFOLIA

CRAWE SEDGE
DUNE THISTLE
DUNE THISTLE
VARIEGATED HORSETAIL
SEASIDE SPURGE

ST
ST LT
ST LT
SE
~~WL~~

037N009W
037N009W
037N009W
037N009W
037N009W

INDIANA HARBOR
INDIANA HARBOR
EDGEMORE
INDIANA HARBOR
INDIANA HARBOR

1903 3.6
1916 3.6
1882 3.6
1902 3.6
1908

JUNIPERUS COMMUNIS

GROUND JUNIPER

~~SR~~

037N009W

1 MI E OF
INDIANA HARBOR

1907

LATHYRUS MARITIMUS VAR GLABER
POTENTILLA ANSERINA
SALIX CORDATA

BEACH PEAVINE
SILVERWEED
HEARTLEAF WILLOW

SE
ST
ST

037N009W
037N009W
037N009W

INDIANA HARBOR
INDIANA HARBOR
NEAR IND.
HARBOR

1907 3.6
1906 3.6
1908 3.6

SATUREJA GLABELLA VAR
ANGUSTIFOLIA

CALAMINT

SE

037N009W

NEAR INDIANA
HARBOR

1907 3.6

SOLIDAGO SIMPLEX VAR GILLMANII STICKY GOLDENROD

ST C2

037N009W

1.25 MI E OF
INDIANA HARBOR

1907 3.6

TOFIELDIA GLUTINOSA

FALSE ASPHODEL

~~SR~~

037N009W

2 MI E OF
INDIANA HARBOR

1906

FALCO PEREGRINUS
CAKILE EDENTULA VAR LACUSTRIS
AMMOPHILA BREVILIGULATA
CAKILE EDENTULA VAR LACUSTRIS
CAKILE EDENTULA VAR LACUSTRIS
ELEOCHARIS GENICULATA
EUPHORBIA POLYGONIFOLIA
PLATANHERA HYPERBOREA
RHUS AROMATICA VAR ARENARIA
SOLIDAGO PTARMICOIDES
BUCHNERA AMERICANA
HYPERICUM KALMIANUM
SOLIDAGO PTARMICOIDES

PEREGRINE FALCON
AMERICAN SEA-ROCKET
MARRAM GRASS
AMERICAN SEA-ROCKET
AMERICAN SEA-ROCKET
CAPITATE SPIKE-RUSH
SEASIDE SPURGE
LEAFY NORTHERN GREEN ORCHIS
BEACH SUMAC
PRAIRIE GOLDENROD
BLUEHEARTS
KALM ST. JOHN'S-WORT
PRAIRIE GOLDENROD

SE E/SA
~~WL~~
~~WL~~
~~WL~~
~~WL~~
ST ✓
~~WL~~
ST
ST ✓ C2
~~SR~~
SE
~~WL~~
~~SR~~

037N009W 21
037N009W 22
037N009W 23
037N009W 23
037N009W 23
037N009W 23
037N009W 23
037N009W 23
037N009W 23
037N009W 25
037N009W 25
037N009W 25

NEQ NWQ NWQ
SEQ NEQ NEQ
SWQ NWQ
SEQ & SWQ
SWQ NWQ
SWQ SWQ
SEQ & SWQ
SWQ SWQ
SEQ
NWQ SWQ
CTR WH SWQ
CTR WH SWQ
CENTER OF WH OF
SWQ

1993 3
1994
1994
1994
1994
1975 3.6
1994
1994 3.6
1994 3.6
1987
1991
1991
1991

PRAIRIE - SAND DRY
PRAIRIE - SAND DRY-MESIC
PRAIRIE - SAND WET
WETLAND - MARSH
ARCTOSTAPHYLOS UVA-URSI

DRY SAND PRAIRIE
DRY-MESIC SAND PRAIRIE
WET SAND PRAIRIE
MARSH
BEARBERRY

~~SG~~
~~SG~~
~~SG~~
~~SG~~
~~SR~~

037N009W 26
037N009W 26
037N009W 26
037N009W 26
037N009W 26

SH NWQ + NH SWQ
SH NWQ + NH SWQ
SH NWQ + NH SWQ
NWQ SWQ

1978
1978
1978
1978

STATE: SX-extirpated, SE-endangered, ST-threatened, SR-rare, SSC-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, CI-proposed to be listed, C2-under review, 3C-delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name.....	Common Name.....	State Fed..	Townrange	Sec.....	Date	Comments.....	
BETULA Papyrifera	PAPER BIRCH	WL	037N009W	26	SH NWQ + NH SWQ	1978	
BETULA Papyrifera	PAPER BIRCH	WL	037N009W	26	SEQ SWQ	1986	
BUCHNERA AMERICANA	BLUEHEARTS	SE	037N009W	26		1906 3.3	
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR	037N009W	26		1899	
CYPRIPEDIUM CALCEOLUS VAR PARVIFLORUM	SMALL YELLOW LADY'S-SLIPPER	SR	037N009W	26		1899	
CYPRIPEDIUM CANDIDUM	SMALL WHITE LADY'S-SLIPPER	SR	3C	037N009W	26	1889	
ELEOCHARIS PAUCIFLORA	FEWFLOWER SPIKERUSH	WL	037N009W	26		1903 3.3	
GERANIUM BICKNELLII	BICKNELL NORTHERN CRANE'S-BILL	SE	037N009W	26		1903	
			037N009W	25			
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	037N009W	26	S1/2 NWQ + N1/2 NWQ	1978	
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	037N009W	26	SEQ SWQ	1986	
OROBANCHE FASCICULATA	CLUSTERED BROOMRAPE	SE	037N009W	26		1889 3.3	
PLATANHERA HOOKERI	HOOKER ORCHIS	SK	037N009W	26		1897	
POGONIA OPHIOGLOSSOIDES	ROSE POGONIA	WL	037N009W	26		1899	
RHUS AROMATICA VAR ARENARIA	BEACH SUMAC	ST	C2	037N009W	26	1904	
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR	037N009W	26	SH NWQ + NH SWQ	1978	
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR	037N009W	26	SWQ. + S35	1986	
THUJA OCCIDENTALIS	NORTHERN WHITE CEDAR	SE	037N009W	26	SWQ NWQ	1978 3.3	
UTRICULARIA CORNUTA	HORNED BLADDERWORT	ST	037N009W	26		1910 3.3	
UTRICULARIA MINOR	LESSER BLADDERWORT	SE	037N009W	26		1889 3.3	
UTRICULARIA PURPUREA	PURPLE BLADDERWORT	SR	037N009W	26		1907 3.3	
UTRICULARIA RESUPINATA	NORTHEASTERN BLADDERWORT	SY	037N009W	26		1890	
CLARK AND PINE GEN. REFRACTORIES ADDITION							
BUCHNERA AMERICANA	BLUEHEARTS	SE	037N009W	25	SH SWQ	1991	
GERARDIA SKINNERIANA	PALE FALSE FOXGLOVE	SE	4C2	037N009W	36	1991 3.6	
			037N009W	25			
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	037N009W	36	CENTER NEQ	1991	
			037N009W	25	SH SWQ		
JUNCUS BALTICUS VAR LITTORALIS	BALTIC RUSH	SR	037N009W	36		1991	
			037N009W	25			
LIPARIS LOESELII	LOESEL'S TWAYBLADE	WL	037N009W	36		1978	
			037N009W	25			
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR	037N009W	36	CENTER NEQ	1991	
			037N009W	25	SH SWQ		
SPIRANTHES MAGNICAMPORUM	GREAT PLAINS LADIES'-TRESSES	SE	037N009W	25	SH SWQ	1991	
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR	037N009W	25	SEQ & 30	1991	
					037N008W		
CAREX RICHARDSONII	RICHARDSON SEDGE	SE	037N009W	25	SEQ & 30	1991	
					037N008W		
CAREX CRAWEI	CRAWE SEDGE	ST	037N009W	25	SEQ	1991	
			037N008W	30			
CLARKE JUNCTION EAST							
CLEMmys GUTTATA	SPOTTED TURTLE	ST	037N009W	25	SEQ	1991	
ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	SR	037N009W	25	SEQ	1991	
ARISTIDA INTERMEDIA	SLIM-SPIKE THREE-AWN GRASS	SR	037N009W	25	SEQ	1991	
BETULA Papyrifera	PAPER BIRCH	WL	037N009W	25	SEQ	1991	
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR	037N009W	25	SEQ & 30	1991	
					037N008W		
CAREX CRAWEI	CRAWE SEDGE	ST	037N009W	25	SEQ	1991	
			037N008W	30			
CAREX EBURNEA	EBONY SEDGE	SR	037N009W	25	SEQ	1991	
CAREX GARBERI	ELK SEDGE	ST	037N009W	25	SEQ	1991	
CAREX RICHARDSONII	RICHARDSON SEDGE	SE	037N009W	25	SEQ & 30	1991	
					037N008W		
ELEOCHARIS GENICULATA	CAPITATE SPIKE-RUSH	ST	037N009W	25	SEQ	1991	
ELEOCHARIS PAUCIFLORA	FEWFLOWER SPIKERUSH	WL	037N009W	25	SEQ	1991	
GERARDIA SKINNERIANA	PALE FALSE FOXGLOVE	SE	C2	037N009W	25	SEQ	1991
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	037N009W	25	SEQ	1991	
JUNCUS BALTICUS VAR LITTORALIS	BALTIC RUSH	SR	037N009W	25	SEQ	1991	
PINUS BANKSIANA	JACK PINE	SR	037N009W	25	NWQ SEQ	1991	
RHUS AROMATICA VAR ARENARIA	BEACH SUMAC	ST	C2	037N009W	25	SEQ	1991
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR	037N009W	25	SEQ	1991	

STATE: Sx-extirpated, SE-endangered, ST-threatened, SR-rare, SSC-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, C1-proposed to be listed, C2-under review, 3C-delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name.....	Common Name.....	State Fed..	Townrange	Sec.....	Date	Comments.....
TOFIELDIA GLUTINOSA	FALSE ASPHODEL	SR	037N009W	25	SEQ	1991
PRAIRIE - SAND DRY-	DRY SAND PRAIRIE	SG	037N009W	25	NWQ SWQ+NEQ SEQ	1978
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG	037N009W	25	S26 NWQ SWQ + NEQ	1978
WETLAND - MARSH	MARSH	SG	037N009W	26	SEQ S26	1978
CYPRIPEDUM CALCEOLUS VAR	SMALL YELLOW LADY'S-SLIPPER	SR	037N009W	26	SEQ & 25 SWQ	1987
PARVIFLORUM			037N009W	25	N1/2 SEQ	
THUJA OCCIDENTALIS	NORTHERN WHITE CEDAR	SE	037N009W	26	SWQ	1978 3.3
CLARKE JUNCTION WEST					SEQ. & 25 SWQ	
PRAIRIE - SAND DRY	DRY SAND PRAIRIE	SG	037N009W	25	NWQ SWQ+NEQ SEQ	1978
PRAIRIE - SAND DRY-MESIC	DRY-MESIC SAND PRAIRIE	SG	037N009W	25	S26 NWQ SWQ + NEQ	1978
SATUREJA GLABELLA VAR	CALAMINT	SE	037N009W	26	SEQ S26	1978 3.3
ANGUSTIFOLIA			037N009W	25	SH NEQ & NEQ	
SISYRINCHIUM MONTANUM	STRICT BLUE-EYED-GRASS	SE	037N009W	25	SEQ	1980
CISTOTHORUS PALUSTRIS	MARSH WREN	SSC	037N009W	26	NWQ SWQ	1991
WETLAND - MARSH	MARSH	SG	037N009W	26	SEQ	1978
WETLAND - PANNE	PANNE	SG	037N009W	26	SEQ & 25 SWQ	1978
ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	SR	037N009W	26	NEQ	1991
ARISTIDA INTERMEDIA	SLIM-SPIKE THREE-AWN GRASS	SR	037N009W	26	SH NEQ & NEQ	1980
ASTER JUNCIFORMIS	RUSHLIKE ASTER	SR	037N009W	26	SEQ	
BETULA PAPYRIFERA	PAPER BIRCH	WL	037N009W	26	NWQ NWQ SWQ	1985
BUCHNERA AMERICANA	BLUEHEARTS	SE	037N009W	26	SH NEQ & NEQ	1991
CAREX AUREA	GOLDEN-FRUITED SEDGE	SR	037N009W	26	SEQ	1991 3.3
CAREX CRAWEI	CRAWE SEDGE	ST	037N009W	26	SH NEQ & NEQ	1991 3.3
CAREX EBURNEA	EBONY SEDGE	SR	037N009W	26	SEQ	
CAREX GARBERI	ELK SEDGE	ST	037N009W	26	NWQ NWQ SWQ	1985
CAREX RICHARDSONII	RICHARDSON SEDGE	SE	037N009W	26	SH NEQ & NEQ	1991 3.3
CYPRIPEDUM CALCEOLUS VAR	SMALL YELLOW LADY'S-SLIPPER	SR	037N009W	26	SEQ	1987
PARVIFLORUM			037N009W	25	N1/2 SEQ	
CYPRIPEDUM CANDIDUM	SMALL WHITE LADY'S-SLIPPER	SR 3C	037N009W	26	SWQ	1985
CYPRIPEDUM X ANDREWSII	ANDREW'S LADY'S-SLIPPER	SE	037N009W	26	SH NEQ & NEQ	1985 3.3
ELEOCHARIS GENICULATA	CAPITATE SPIKE-RUSH	ST	037N009W	26	SEQ	1987 3.3
ELEOCHARIS PAUCIFLORA	FEWFLOWER SPIKERUSH	WL	037N009W	26	NH SEQ	1985 3.3
HYPERICUM KALMIANUM	KALM ST. JOHN'S-WORT	WL	037N009W	26	NEQ	
JUNCUS BALTICUS VAR LITTORALIS	BALTIC RUSH	SR	037N009W	26	SWQ	1991
PINUS BANKSIANA	JACK PINE	SR	037N009W	26	SH NEQ & NEQ	1991
RHAMNUS ALNIFOLIA	ALDERLEAF BUCKTHORN	WL	037N009W	26	SEQ	1985
RHUS AROMATICA VAR ARENARIA	BEACH SUMAC	ST	037N009W	26	SH NEQ & NEQ	1980
SATUREJA GLABELLA VAR	CALAMINT	SE	037N009W	26	SEQ	1991 3.3
ANGUSTIFOLIA			037N009W	25	SH NEQ & NEQ	1978 3.3

STATE: SX-extirpated, SE-endangered, ST-threatened, SR-rare, SSC-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, CI-proposed to be listed, C2-under review, 3C-delisted

August 24, 1994

ENDANGERED, THREATENED, AND RARE SPECIES
AND HIGH QUALITY NATURAL COMMUNITIES AND NATURAL AREAS DOCUMENTED WITHIN
A FOUR MILE RADIUS AND 15 MILES DOWNSTREAM (GRAND CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN)
OF THE EAST CHICAGO CITY DUMP, EAST CHICAGO, INDIANA

Element Name..... Common Name..... State Fed... Townrange Sec..... Date Comments.....

SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	SR	037N009W 26	SWQ	
			037N009W 25	SH NEQ & NEQ	1991
				SEQ	
SPIRANTHES MAGNICAMPORUM	GREAT PLAINS LADIES'-TRESSES	SE	037N009W 26	NWQ NWQ SWQ	1990 3.3
THUJA OCCIDENTALIS	NORTHERN WHITE CEDAR	SE	037N009W 26	SEQ	1978 3.3
				SEQ. & 25 SWQ	
LAND AND WATER CONSERVATION FUND SITE #18-00168 - SUNNYSIDE PARK			037N009W 22	SEQ	

STATE: SX-extirpated, SE-endangered, ST-threatened, SR-rare, SSC-special concern, WL-watch list, SG-significant
FEDERAL: LE-endangered, LT-threatened, C1-proposed to be listed, C2-under review, 3C-delisted